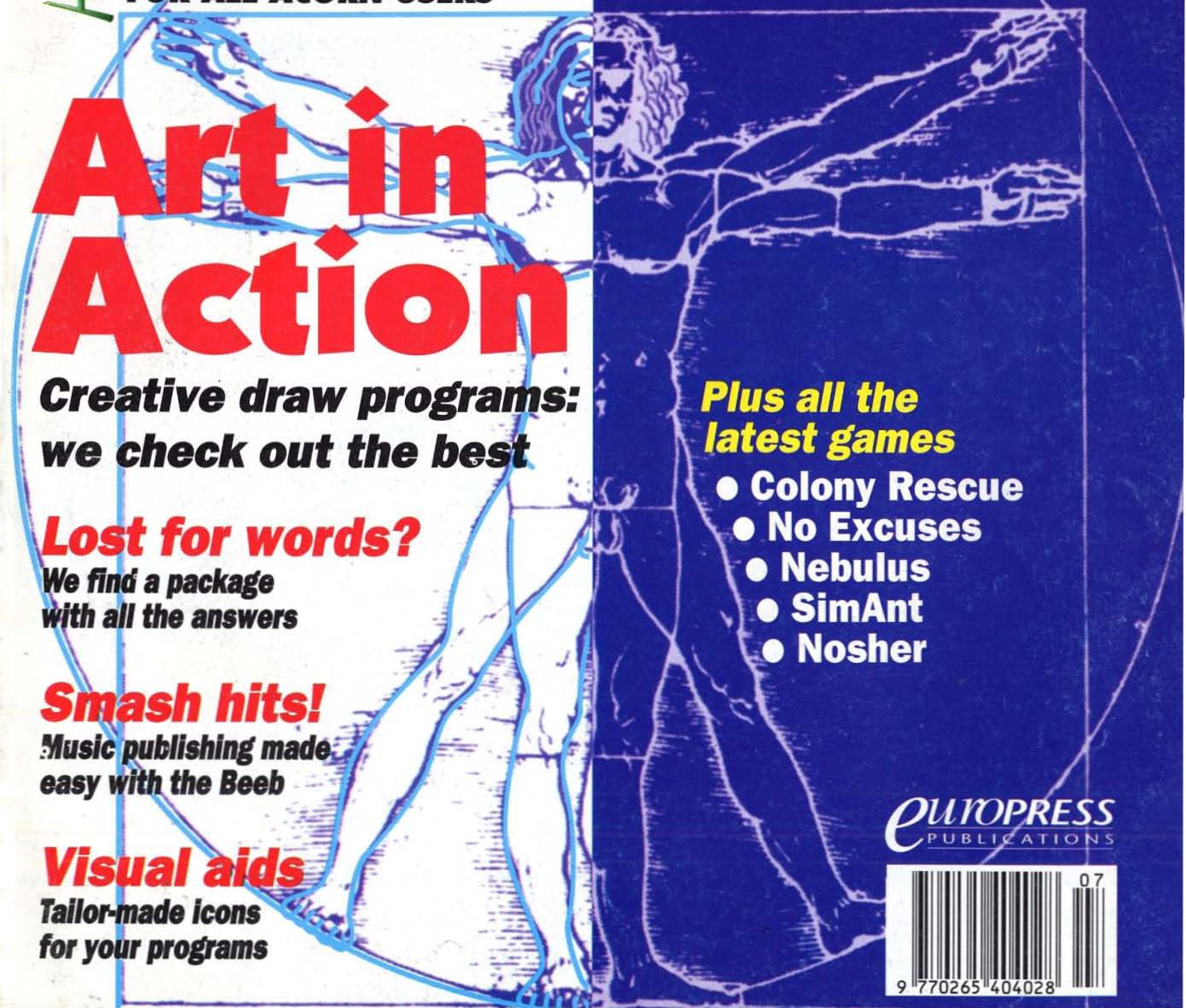
THE MICRO USER

Volume 10
Number 5
July 1992
£1.95

THE COMPLETE SOLUTION
FOR ALL ACORN USERS

INSIDE
Essential Archimedes
Packed full of hints and tips



Art in Action

Creative draw programs: we check out the best

Lost for words?

We find a package with all the answers

Smash hits!

Music publishing made easy with the Beeb

Visual aids

Tailor-made icons for your programs

Plus all the latest games

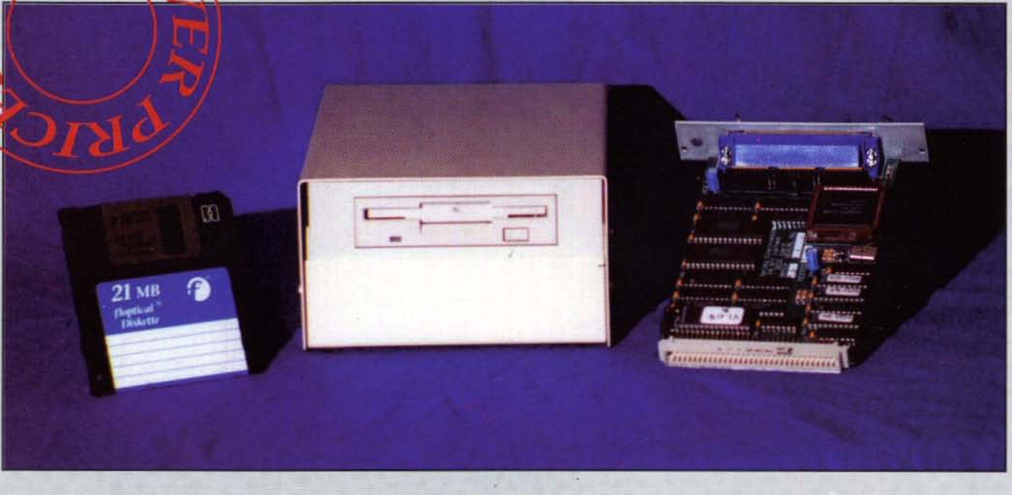
- Colony Rescue
- No Excuses
- Nebulus
- SimAnt
- Nosher

europress
PUBLICATIONS

BBC A3000 ● Archimedes ● BBC Micro ● Master series

Every few *years* a product comes *along*

NEW LOWER PRICES



which changes *your whole* perspective.

THIS REMARKABLE new disc drive gives users an amazing 21MB of space on each special floppy disc. The drive works by utilising an optical tracking system which finds space between the grooves on the disc, with the information being stored magnetically as on a standard floppy diskette.

THE DISCS are interchangeable so realistic, unlimited storage capacity is available for floppy disc drive users for the first time.

THE DRIVE is also capable of formatting the normal double and high density discs to its own format so you can also utilise your existing discs. By using Morley Electronics own SCSI interface card and software the drive appears on the icon bar as a hard disc drive and can then be used to store data just as with a hard or floppy disc.

DATA can be copied to and from other drives just as you would normally and all of the usual RISC OS functions can be carried out.

WE BELIEVE that this drive represents the next step forward in data storage and are offering the drive complete with our own SCSI interface card at the following prices.

Available for the A3000 and higher

External 21MB Mechanism	**£499.00**
Internal 21MB Mechanism	**£425.00**
Extra Floptical Disc	**£25.00**
5 Floptical Discs	**£100.00**

Please state computer type when ordering
Mechanism prices include SCSI Interface card, software, all cables and case, manuals and one 21MB Floptical disc.

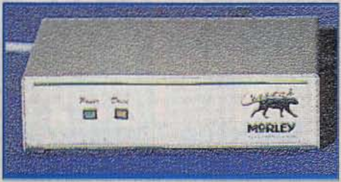
MORLEY
E·L·E·C·T·R·O·N·I·C·S · L·T·D

Hard Disc Drives

Morley Hard Disc Drives and interfaces are now renowned throughout the Acorn community. A combination of the fastest and most compatible interface available, together with high quality drive mechanisms means you can be confident that you are making an investment for the future.

The interface card is fully Acorn compatible and is the only ANSI level 1 & 2 compliant card on the market. It works with amongst others Fujitsu, Rodime, Quantum, Miniscribe and Connor hard disc drives as well as Wangtek tape streamers, Morley's own removable hard discs, Computer Concepts Scanlight Professional and is guaranteed to work with any ANSI compliant SCSI device. The card can give sustained data transfer rates of up to 4MB per/s. It is also fully compatible with RISC-OS 2 & 3 and fits the A3000, 300, 400, 540 and the new A5000 so when you upgrade machines you can hang on to your hard disc without any problems. If you already have a hard disc inside your computer but would like to have the benefits of a SCSI drive,our card lives quite happily alongside any existing ST506 or IDE interface.

A3000 Fixed Hard Discs	
52MB	£379.00
100MB	£499.00



A300*, A400 & A5000 Fixed Hard Discs	
52MB	£299.00
100MB	£449.00

Other SCSI devices

Removable Cartridge Hard Disc	
44MB mechanism	£575.00
90MB mechanism	£775.00
44MB Cartridge	£69.00
90MB Cartridge	£109.00

Tape Streamers	
150MB tape streamer	£799.00
150MB tapes	£29.00

All prices include standard interface card, all necessary software, cables and cases. and one tape/disc where appropriate. For cached interface card please add £50.00.

*Please note that 300 series computers require both a MEMC1A upgrade and a backplane to be fitted. Both available from Morley please call for prices.

Memory Expansion

Morley memory expansion boards for the A3000 are high quality four layer boards and unlike most other cards can be expanded at a later date for maximum flexibility.

A3000 1MB Non-Exp	£59.00
A3000 1MB Expandable	£69.00
A3000 3MB Upgrade	£179.00
1MB to 3MB upgrade	£145.00
305 1/2 MB	£69.00
400 series per 1MB	£50.00

Analogue & User Port

Full specification BBC analogue & user port for the A3000. The analogue port is accessable using ADVAL from BASIC 5 with all BBC OSbyte calls supported. As supplied to Acorn Computers for their special access A3000.

Analogue & User Port	£59.00

Sparkle

Sparkle is a RISC OS compliant control package for the A3000 and Archimedes allowing full control of input, output and motor devices via most control boxes. Effectively Sparkle introduces the user to the world of control through a simple language which gives full access to control boxes as well as the ability to carry out data and frequency logging via analogue equipment. Inputs and outputs are simulated on screen and the package includes full counting and timing facilities. Numerous examples are included as are various exercises. Sparkle can control Deltronics, Phobox and Andi-Oddule control boxes as well as being the LEGO® dacta recommended control software for their Interface A control box. Please state control box when ordering.

Sparkle	£59.00
Sparkle for LEGO®	£59.00
Sparkle Site Licence	£200.00
LEGO® dacta Interface A Control Box	£120.00

MORE
for your
MONEY

Teletext Adapter

The Morley Teletext adapter. Buy the product that launched a company. A legend in its own lifetime etc. etc.

BBC Master	£104.00
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Archimedes	£125.00
Optional PSU	£9.50
*BBC to Arc. upgrade	£35.00

*(Adapter needs to be sent to Morley)

Hardware

We also supply the full range of Acorn computers from the A3000 to the 540. Please phone for competitive prices. We are also happy to quote for customised versions or quantities of Acorn computers. If you have a question about any of our products especially concerning compatability with your existing equipment, please feel free to call us and we will do our best to answer it for you.

Morley's demonstration room.

All Major Credit Cards Accepted
Education & dealer enquiries
welcome.
All prices exclude VAT and carriage

Morley Electronics Ltd, Morley House, West Chirton, North Shields
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Please send me a full product catalogue & price list
Name
Address

I am most interested in:
☐ Memory upgrades
☐ 8 bit products
☐ SCSI and devices
☐ Control

MU03/92

091 257 6355

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REGULARS

News 13
All the latest events in the ever-changing world of your Acorn computer.

ScreenPlay 47
Our reviewers record their verdicts on the very latest games releases including:
- Nebulus
- SimAnt
- No Excuses
- Nosher
- Colony Rescue

No Excuses

Colony Rescue

Nosher

PD Page 55
Find out what's new and best in the nearly-free world of public domain.

Problem Solved 81
A helping hand with some of those mind-testing hardware problems.

Body Building 84
★ Our technical guru explores even more ways to expand your computer.

Ten games for a tenner
– it's history in your hands.

– See Page 94

Letters 104
You can get your news, views, comments and ideas into print.

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Discover how to follow Acorn's rules and put colourful icons on your own programs.

High definition 101
Take the pain out of dissecting screen characters with this simple utility.

REVIEWS

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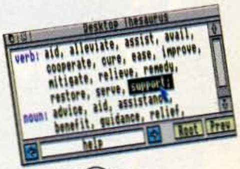
We examine another clutch of programs hatched from the Acorn's egg.

Music Publisher 29
Quality music output from the humble Beeb – it can be done and we check it out.

Desktop Thesaurus 97
A word in your micro. How effective is the new synonym finder?



verb: aid, alleviate, assist, avail,
cooperate, cure, ease, improve,
mitigate, relieve, remedy,
restore, serve, support;
noun: advice, aid, assistance,
benefit, guidance, relief,

help

LET'S
COMPUTE!

Simple sections that teach you the basics of computer programming

Rom & Ram 88
★ Sounds awful? It must be the gruesome twosome with their drum machine.

Safe Scientist 92
★ Trying to lever himself through a door, the mad professor sits on a fulcrum.

★ This symbol indicates that the feature contains at least one full length listing for you to key in on your micro. All programs for your machine are on the subscribers disc.

Get it right ✓ All the major listings in this magazine are accompanied by checksums to help you key them in correctly.
For full details of how to use them see the article on Page 86 of the February 1992 issue

Art and the mouse

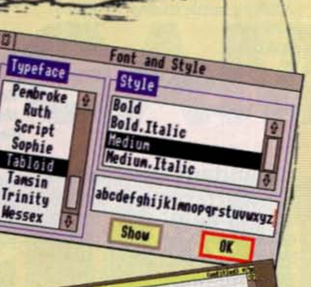
This month in *The Micro User* we are taking a close look at many of the latest software packages that make it easier for you to create interesting art.

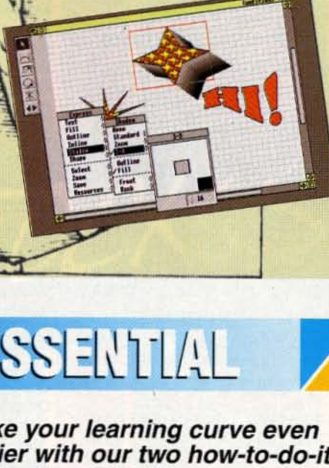
Vector 23
This new drawing package can produce amazing effects.

Titler 40
Make your video captions and presentations come alive.

Midnight Express 43
Can this be the easiest-to-use graphics program yet?

Outliner 95
Convert sprites into drawfiles with this excellent product.


Font and Style
Typeface
Pembroke
Ruth
Script
Sophie
Tabloid
Tamsin
Trinity
Wessex
Style
Bold
Bold.Italic
Medium
Medium.Italic
abcdefghijklmnopqrstuvwxyz
Show
OK



THE MICRO USER
THE MICRO USER

July subscription disc

This month's discs are chock full of goodies from the program listings and public domain. The 8-bit BBC Micro disc is crammed with some superb PD software, with the Archimedes disc featuring a massive Ice Cream demo from the authors of !Slide.

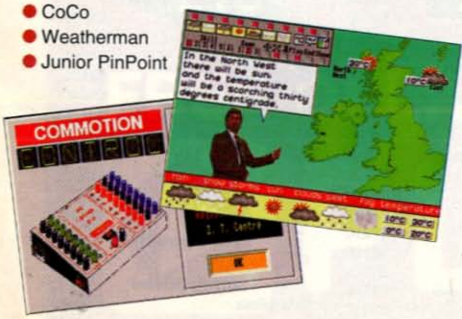
If you'd like to know more about how to get your very own disc each month turn to page 14.

EDUCATION

Update 33
Up-to-the-minute news of Acorn micros from the world of education.

Reviews 34
Looking at the best in software for the Acorn computers in schools:

- CoCo
- Weatherman
- Junior PinPoint


COMMOTION
OK

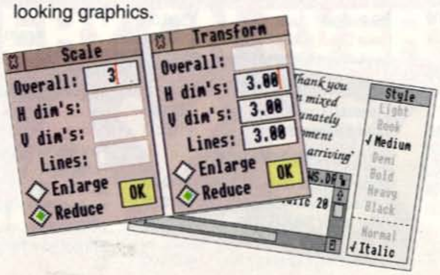
In the North West there will be sun and the temperature will be a scorching thirty degrees centigrade.

ESSENTIAL

Make your learning curve even easier with our two how-to-do-it series for all 32-bit owners:

Desktop Publishing 59
You may have the tools for page makeup, but how can you use them effectively?

Computer Aided Design 65
Make a good impression with professional-looking graphics.


Style
Light
Book
Demi
Bold
Heavy
Black
Normal
OK
OK

Scale
Overall: 3
H dim's:
V dim's:
Lines:
◇ Enlarge
◆ Reduce

Transform
Overall:
H dim's: 3.00
V dim's: 3.00
Lines: 3.00
◇ Enlarge
◆ Reduce

✓ Medium
✓ Italic

BARGAIN BASEMENT

is open on Page 102

Hardware and software classifieds

Next month in THE MICRO USER

We'll be taking a look at digital cameras and how you can use them with your 32-bit machine. Plus all our regulars, reviews and the money-saving PD page.

061 766 8423

Phone lines open :-
Mon - Fri 09.00 - 17.00
Sat 10.00 - 17.00

FAX: 061 766 8425

Acorn Hardware

A540 inc. 4Mb Ram, 120Mb HD, Arm3, Taxan 775	£2495.00
A5000 inc. 2Mb Ram, 40Mb HD, Arm3, Acorn Multiscan Monitor	£1499.00
A5000 Learning Curve as above c/w Audio Training Cassette, Guide to National Curriculum, Acorn Applications Suite, Pacmania, PC Emulator , Genesis, 1st word Plus, Acorn DTP	£1531.06
A5000 LC / Acorn Printer as above c/w Acorn JP150 Inkjet Printer	£1765.96
A3000 c/w 2Mb Ram fitted	£599.00
A3000 Learning Curve as above c/w Audio Training Cassette, Guide to National Curriculum, Acorn Applications Suite, Pacmania, PC Emulator, Genesis, 1st Word Plus	£642.29
A3000 LC / Acorn Monitor as above c/w Acorn Colour Monitor	£855.05
A3000 LC / Acorn Monitor / Acorn Printer as above c/w Acorn JP150 Inkjet Printer	£1089.95

Acorn Special Needs Centre

A3000 Special Access Acorn Serial Upgrade, Morley User/Analogue Expansion Card, Acorn Software Suite, Utilities Disc, SEMERC & ACE Special Needs Handbook	£679.00
A3000 Special Access / Acorn Colour Monitor / Stand as above c/w Acorn Monitor and Pres Monitor Stand	£899.00
Master 128	£399.00

We operate the Acorn Teachers and 0% Finance Schemes

Please call for free information pack

A540 Upgrades

4Mb Ram Upgrade	£369.00
Taxan 795 VIDC Modes Disc	£7.50
Technical Reference Manual	£65.00

A5000 Upgrades

2Mb Ram Card	£110.00
Technical Reference Manual	£65.00

A400 Upgrades

1 Mb Ram	£35.00
2 Mb Ram	£65.00
3 Mb Ram	£99.00
5.25" Ext. floppy disc int.	£39.00
Econet Module	£46.00
VIDC Enhancer	£29.00

A3000 Upgrades

1 Mb Ram (2 Mb in total)	£55.00
4 Mb Ram	£159.00
20 Mb Int Hard Disc (IDE)	£199.00
5.25" External f/disc buffer	£39.00
Serial Upgrade	£19.00
Serial Link Kit (BBC-Arc)	£14.00
User & Analogue Podule	£46.00
User & Midi Podule	£46.00

Fax

Fax Pack (CC)	£279.00

Expansion Cards

ArVis S-VHS Video Board	£295.00
ArVis S-VHS Encoder Board	£145.00
ArVis Video Graphics Board	£877.00
Chroma 345 Overlay Board	£389.00
Econet Module	£46.00
Ethernet Expansion Card II	£249.00
Floating Point Expansion Card	£449.00
Hawk V9 Video Digitiser	£199.00
I/O Expansion Card	£79.00
Midi Upgrade to I/O Card	£27.00
Midi Expansion Card	£65.00
ROM Expansion Card	£45.00
SCSI Expansion Card (Acorn)	£229.00

New from Rombo Vidi-Archimedes Colour Digitiser

Special Price

A3000 inc. podule housing	£72.30
A400 series	£72.30
A5000	£72.30

Aleph 1

Arm 3 Upgrade	£199.00
386 PC Expansion Card 1Mb	£495.00
386 PC Expansion Card 4Mb	£595.00

Standard Monitors

Acorn Colour	£199.00
Microvitec Cub 3000	£199.00
Philips CM8833 II	£199.00
Philips Mono (Green)	£85.00

All monitors come with free lead. State type of computer when ordering.

Multiscan Monitors

EIZO 9060SZ Flexiscan	£419.00
Taxan 775 Multivision	£389.00
Taxan 795 Multivision *	£449.00
Taxan Viking II Mode 23	£749.00

* comes with free VIDC enhancer.

Floppy Disc Drives

5.25" Single 40/80 no psu	£95.00
5.25" Single 40/80 with psu	£109.00
5.25" Dual 40/80 no psu	£185.00
5.25" Dual 40/80 with psu	£199.00
3.5" Single with psu	£85.00
3.5" + 5.25" 40/80 with psu	£209.00

Printers

Canon Bubblejet BJ-10e	£219.00
Canon BJ10e inc. turbo driver	£249.00
Sheetfeeder for BJ-10e	£59.00
Canon BJC800 (col.) inc. s/w	£1895.00
Citizen 120D+	£114.00
Citizen Swift 9	£169.00
Citizen Swift 24e	£239.00
Colour Kit for above	£39.00
Citizen Swift 224	£199.00
Citizen Swift 224 Colour	£229.00
Star LC20	£130.00
Star LC200 Colour (9 pin)	£189.00
Star LC24 - 200	£219.00
Star LC24 - 200 Colour	£259.00
Integrex Colourjet 132	£519.00
HP Deskjet 500	£339.00
HP DeskJet 500C	£599.00
HP Paintjet	£599.00
Laser Direct (LBP4 Hi Res.)	£849.00
Laser Direct (LBP8 Hi Res.)	£1289.00

Econet

Broadcast Loader	£60.00
Level 4 Software	£199.00

Scanners

Flatbed A4 256 Grey SCSI (CC)	£849.00
Flatbed A4 with SCSI card	£949.00
Scan Junior Scanner 256	£199.00
Scanlight Senior Scanner A4	£289.00
Sheet Feeder for above A4	£135.00

Printer Drivers

Midnight Graphics

Citizen Swift 9 Sprite Dump	£26.04
Citizen Swift 24 Sprite Dump	£26.04
Epson 24 Sprite Dump	£26.04
HP Deskjet 500C Sprite Dump	£26.04
HP Paintjet Sprite Dump	£26.04
Integrex 132 Sprite Dump	£26.04
Integrex Colourcel Sprite Dump	£26.04
Juki 5520 Sprite Dump	£26.04
Star LC10 Sprite Dump	£26.04
Star XB24 Sprite Dump	£26.04
Star LC200 Sprite Dump	£26.04
Star LC24-200 Sprite Dump	£26.04

Ace Computing

Printer JX (Colour Dot Matrix)	£14.00
Printer DJ (Deskjet 500C)	£14.00
Printer PJ (Paintjet)	£14.00
Printer CA (Canon Colour)	£14.00

Electronic Font Foundry

BubbleJet - BJ10e/130e	£10.00

Cables

Arc - Monitor - 8833 inc sound	£8.65
Arc - Monitor - 8833 II inc sound	£8.65
Arc - Parallel Printer Cable	£5.00
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Blob 1	£18.00
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Chick Chase (80 Track Only)	£15.00
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White Knight	£18.00
White Magic	£11.26

Master Compact

Play It Again Sam No's 1 - 16 ea.	£13.00
UIM	£14.95
ViewPlot	£29.95
ViewSheet	£40.00
ViewStore	£45.00

Archimedes Software

4 Mation

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Craftshop 1	£29.00
Craftshop 2	£29.00
Jiglet	£29.00
Jigsaw	£29.00
Poster	£75.00
SmArt	£55.00
SmArtFiler	£35.00
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Ace Computing

ArcLight	£43.00
Euclid	£40.00
Mogul	£17.00
Splice	£26.00
Tween	£26.00

Acorn Computers

1st Word Plus	£65.00
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Desktop C (V 4)	£185.00
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Fortran 77	£99.00
ISO Pascal	£99.00
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Switch On Actions	£20.00
Teds Adventures	£20.00

Cambridge International Sotware

Fireball II	£10.00
Mah-Jong Patience	£15.00
Mental Maths	£15.00
Microdrive	£14.00

Clares Micro Supplies

Artisan 2	£45.00
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Interdictor	£10.00
Interdictor II	£25.00
ProArtisan	£70.00
Render Bender 2	£99.00
Rhapsody 2	£45.00
Schema	£90.00

Colton Software

Pipedream 3	£105.00
Pipedream 4	£179.00

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Equasor	£39.00
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Impression Business Suppliment	£39.00
Impression II Free Drawfile Disc	£124.00
Impression Junior	£70.00
Inter-Word	£29.00
Show Page	£109.00

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Twin World	£14.00

Dabs Press

Arc DFS	£22.00

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Fun School 3 under 5s	£19.95
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Fun School 3 Over 7s	£19.95

Domark

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Pipemania	£16.00

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Microstudio	£78.00
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RhythmBox	£29.00
SoundSynth	£39.00
Studio 24 Plus	£149.00

ESM

Desktop Folio	£79.00

Hybrid

Elite	£32.99

Icon Technology

EasiWriter	£115.00

Krisalis Software

Chuck Rock	£19.00

James Pond	£20.00
Lemmings	£20.00
Mad Professor Mariarti	£14.00
Manchester United Europe	£19.00
Nebulus	£20.00
Swiv	£20.00
World Champ. Boxing Manager	£19.00
World Championship Squash	£18.00

Lingenuity

HotLink Presenter	£34.00
Presenter II	£29.00

Longman Logotron

ArcComm 2	£54.00
Landmarks No's 1 - 4 each	£19.00
Magpie	£54.00
Notate	£55.00
Numerator	£60.00
Pendown	£54.00
Pendown Outline Fonts	£18.00
Pinpoint	£75.00
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Revelation 2	£99.00
SkyHunter	£24.00

Magnetic Scrolls

Collection 1 (3 Adventures)	£29.50
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MicroPower

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Zelanites	£15.00

Midnight Graphics

ClipArt 1 over 480 images	£29.95
ClipArt 2 over 350 images	£29.95
Express	£51.02
Tracer	£52.13

Minerva Software

Applications

Ancestry	£59.00
Atelier	£69.00
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Easiword	£19.00
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Graphbox	£60.00
Graphbox Professional	£109.00
Home/Club Accounts	£35.00
Multistore II	£179.00
PCAccess	£19.00
PrimeArt	£69.00
Timetabler	£599.00

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Bughunter in Space	£13.00
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Casino	£13.00
Caverns	£13.00

Family Favorites	£13.00
Freddy's Folly	£13.00
Hoverbod	£13.00
Ibix the Viking	£13.00
Jet Fighter	£13.00
Maddingly Hall	£13.00
Orion	£13.00
Redshift	£13.00
Talisman	£13.00
Thundermonk	£13.00

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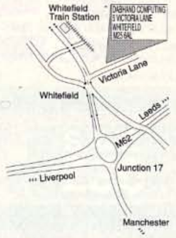

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[19.05.92]

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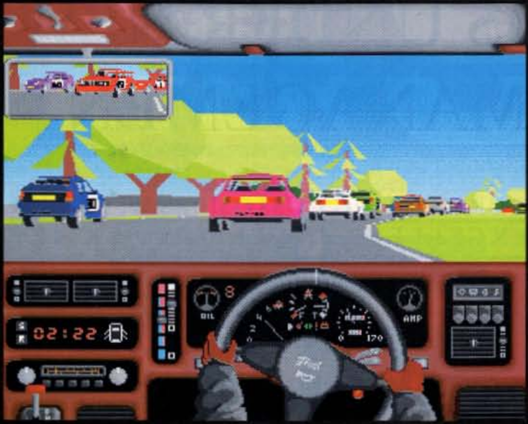
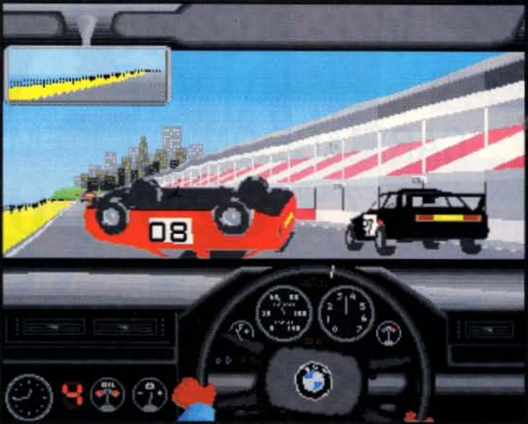
PRODUCED by The Fourth Dimension .... THE Acorn Games Specialists

Saloon Cars *DELUXE*

The **Improved** Driving *"Game-ulation"!*

UPGRADE for ½ PRICE Only £17.50

This new improved DELUXE version of *Saloon Cars* includes many new features suitable for upgraded machines and A5000s, plus many new features suitable for all machines......

REAR-VIEW MIRROR

Improved rear-view mirror.

Improved improved rear-view mirror suitable for Arm3 users.

COMPATIBILITY

Compatible with Course disc to be released soon (see below).

Compatible with Formula 1 upgrade to be released in response to demand for a decent Formula 1 simulation on the Archimedes (hopefully late 1992).

Compatible with Saved Players from ***Saloon Cars v1.0***.

GRAPHICS

New car graphics, featuring the most sophisticated vector graphics ever seen in a home computer game, allowing full 3D rotations of cars - other cars can actually spin off the track in front of you.

More realistic crashes, allowing other cars to have smash-ups almost as spectacular as your own (2MByte only).

Gameplay has been enhanced immeasurably by the addition of a completely new loading screen.

COURSES

New practice course (Test Track), easier (less hard) to stagger round than the old one.

Even more detailed and realistic features on most courses.

Detailed and Fast modes on some courses to allow use of the full potential of the Arm3 without compromising Arm2 users.

BORING TECHNICAL JARGON

Can be installed onto and run from Hard Disc.

Features minor refinements to the more anomalous features of the original ***Saloon Cars v1.0***. (Most of the bugs have been fixed!).

Unique integration process allowing speed variations in processing to maintain the highest possible frame rate at all times whilst maintaining perfect real time simulation of the race. (The game doesn't slow down when the graphics do!).

Special mode for machines with more memory which uses the extra capacity to enhance the speed and complexity of the graphics.

AND FINALLY

Many more features which we want to be a surprise.

Probably a few more features we haven't even thought of yet, and....a few we didn't think up at all.

OLD FEATURES

Saloon Cars DELUXE still...

does not provide a realistic simulation of a full time office job,

does not make the coffee,

and it still isn't quite as good as actually going out for a drive in a Sierra Cosworth.

OLD REVIEWS OF *SALOON CARS v1.0*

"***Saloon Cars*** is the definitive racing game. It is pure, unadulterated fun." ***Archimedes World '91.***

"Make no mistake: the speed and smoothness of this game has to be seen to believed." ***Syracuse '91.***

"...you cannot help but be astounded at the gameplay." ***Club A3000 '91.***

SALOON
CARS
FOURTH DIMENSION

Acorn A3000, A5000 & Archimedes Price £34.95

**To upgrade simply return the whole original *Saloon Cars* directly to us plus payment.
We'll send you the newly packaged / enhanced 3 disc DELUXE version on release.**

SALOON CARS DELUXE COURSES

The new ***DELUXE*** version still contains the 2 real courses, Silverstone and Brands Hatch, plus a newly designed wide practice course called Test Track ideal for beginners.

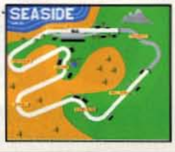
BRANDS HATCH

SILVERSTONE

SALOON CARS EXTRA COURSES

This new Course disc contains 3 superb new courses which are only compatible with the new ***DELUXE*** version. They cost £19.95 and will be released hopefully in late June '92.

DONNINGTON PARK



OULTON PARK

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THE Acorn Games Specialists

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Chocks Away £25.95
Extra Missions £19.95 Compendium £39.95

Cataclysm £25.95
Can now be installed onto Hard Disc

Black Angel £34.95 (Hopefully July)
Can be installed onto Hard Disc

Break 147 & Superpool £34.95
Can now be installed onto Hard Disc

Enter The Realm £25.95

Chopper Force £29.95 (Hopefully June/July)
Can be installed onto Hard Disc

Grievous Bodily 'ARM £25.95
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OULTON
PARK

Saloon Cars Extra Courses £19.95 (Hopefully June) Compatible only with DELUXE version

Cyber Chess £49.95 (Hopefully June)
Can be installed onto Hard Disc

Nevryon 2 - Technodream £25.95 (Hopefully June)
Can be installed onto Hard Disc

Saloon Cars DELUXE £34.95 (Upgrade £17.50)
Can be installed onto Hard Disc (Hopefully May)

Pandora's Box £25.95

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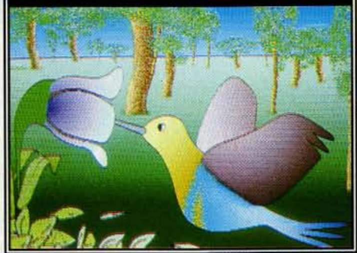
ProArtisan £105



First there was the *Artisan* and *ProArtisan* series – still the most widely used art packages in education today. They feature an intuitive icon based menu system that has proved usable by children as young as three years old. Yet they are powerful enough to be used by serious artists.

Artisan is in its second generation *(Artisan II)* and provides many useful and unique features. This is the one for younger children and anyone interested in textile design. ProArtisan is a more sophisticated package but retains the familiar interface of Artisan II – an easy upgrade path.

No, this isn't a bird eating spider and no *Illusionist* doesn't replace *ProArtisan*. *Illusionist* is a graphics package for those who don't have the skills or inclination for free format painting.

Illusionist £99.95

With *Illusionist* you create a wire frame outline of your image using pre defined shapes. In addition you can define your own shapes or distort any existing shapes. This makes it very easy to generate images even if you can't draw a straight line. You can assign colours and textures to your objects. You can even give them texture maps. A texture map is any Mode 12 or 13 screen. So you can use a scanned or digitised image, a painting – literally anything!

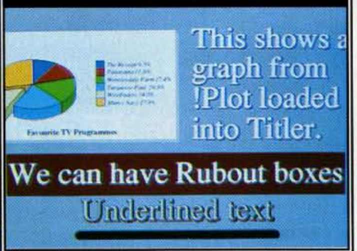
Render Bender II £99.95

NEW REDUCED PRICE

Render Bender II is another top rated graphics package from Clares. Images are created in a similar way to *Illusionist* by defining objects using pre defined shapes. You then add colour, texture, lighting etc. *Render Bender* images can include glass and mirror objects as well as shadowing. *Render Bender* actually calculates the path of light from its source to the imaginary eye at the viewing position. This path takes account of any reflections and refractions.

In addition *Render Bender* can create animated sequences very easily. You can either give objects a formula to control their movement or you can give start and end positions and ask the program to 'in between' the other frames. The result is a stand alone animation that can be passed to friends or even sold.

Titler £149.95



This shows a graph from !Plot loaded into Titler.

We can have Rubout boxes

Underlined text

Finally we have *Titler*. This is a video titling and sequencing package. The *Titler* program uses outline fonts enabling you to create text screens, credits etc. You can have any colour text, background, drop shadow, underline or rub out boxes. You can also include sprites and Draw files in your screen.

The *Titler* screens can be used in the *Sequencer* program along with screens from *Artisan, ProArtisan, Illusionist* and *Render Bender*, as well as lots of other formats. You can also include *Render Bender* or *Euclid* animations, *Tracker* tunes, *Armadeus* samples or Archimedes samples in your sequence. *Sequencer* gives you total control over the display of the screens and provides many effects to switch from one screen to the other. As well as being a tool for video titling this package can be used purely as a presentational tool for preparing and showing lecture notes, demonstrations etc. In fact all of Clares demos are now created using *Titler* and *Sequencer*. *Please request a demo disc that will illustrate the potential of these packages.*

REQUEST YOUR FACT PACK TODAY!

CLARES

98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA. Telephone: 0606 48511 Fax No: 0606 48512

NEWS BEAT

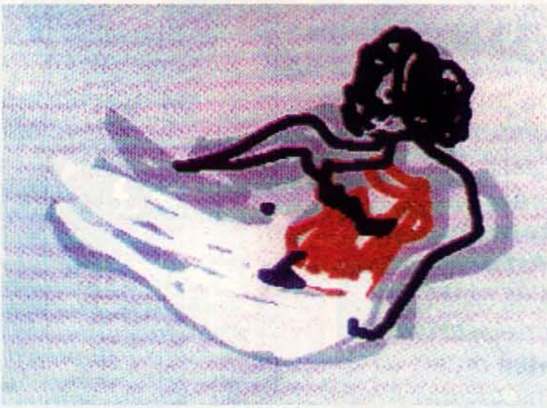
Artful therapy

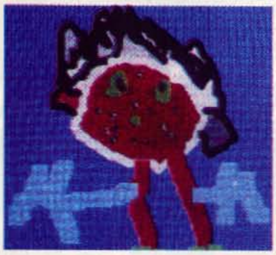
A PROJECT is underway at Nijmegen Polytechnic in the Netherlands using Archimedes computers to help people who are mentally ill or who have learning difficulties or physical disabilities.

By using art packages for therapeutic work the project wants to develop guidelines for creative therapists who would like to work with computers.

The project is headed by Bert Kraan who hopes to make art therapy available to people who can't work with the more common paint and clay.

In his study he is looking at three main areas – how computers can be used to stimulate creative design and be therapeutic, the role of the therapist and whether computer software can provide the same remedial effects as paint and clay.





The project began with an A310 which has been upgraded with 4Mb of ram and a hard disc. It is also connected to a digitiser, PAL-encoder, VHS recorder and camcorder. The software used is ProArtisan, Artisan II, Atelier and Revelation, with output on an HP-Paintjet.

Image processing give clients a new dimension and the mouse, trackerball, graphics tablet and joystick can fulfil a wide range of needs and abilities.

With colleague Erik Nieuwenkamp, Bert Kraan has found that the type of artwork differs when the input device is changed. However, the value of computer graphics packages as tools in therapy still depends on the skill of the therapist in introducing the possibilities at an appropriate point.

Acorn in Australian

ACORN are starting to make quite an impact in Australia and this month sees an Acorn conference at the Raddisson President Hotel in Melbourne.

The emphasis will be firmly on education with 4Mation's Mike Matson addressing the conference and the theme will be on the classroom and how the computer can complement work.

The same venue hosts the Australian Computing in Education Conference the next day. The 9th annual conference of the NSW Computer Education Group starts on July 12 at Bathurst's Charles Stuart University, with the promised new Acorn portable having pride of place.

To complement the UK Acorn Education Directory, there is now a 150 page Australian equivalent which lists software readily available in Australia and New Zealand.

Acorn Australia is also directly involved in sourcing and distributing key Australian, New Zealand and UK software and educational resource materials.

Dutch support

THE Big Ben Club – Holland's Acorn Computer User Society – celebrates it 10th annual open day on September 12 at the community centre, Tripodia in Katwijk.

The club was founded in 1983 and in four years membership ran to a high of 3,500. Big Ben supports all Acorn machines from Electron to Archimedes, and over the last few years the emphasis has shifted towards the 32-bit machines.

The club is the largest user group outside the UK with 18 regional centres. For more information contact: Harry Linsen, Big Ben Club, Gommerskerspel 24, 2151 RA Nieuw-Vennep, Netherlands.

Subscription success

IN our February, March and April issues we offered readers the chance to win an A3000 or an Iota Image Scanner when they took a new or renewed their subscription to *The Micro User*.

The winning entry came from J. Stiles of Bristol (right). He was presented with his BBC A3000 at Watford Electronics brand new purpose-built Luton showroom by editor Steve Turnbull (left) and Shiraz Jessa of Watford Electronics.

A3000
Acorn

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Yours sincerely

Steve Turnbull,
Editor, *The Micro User*

P.S. Don't forget to claim your FREE game.

YOU MUST ACT FAST

For the BBC Micro we have all the type in listings from this issue plus some great animations by Mike Goldberg.

For the 32 Bit Machines the screen editor for Inertia a really funky demo, Dook and two fun games as well as all listings for your computer and the 8 bit machines.

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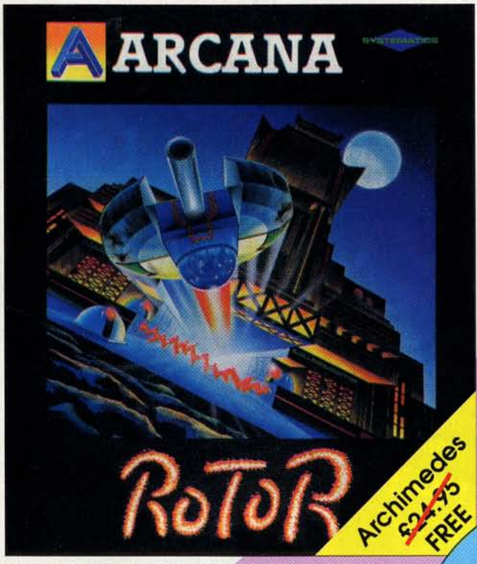
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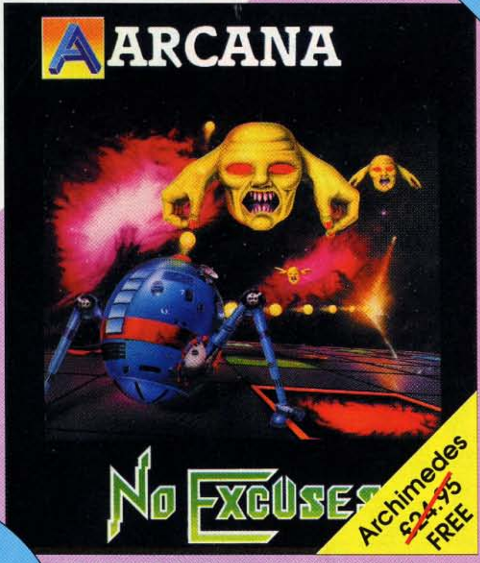
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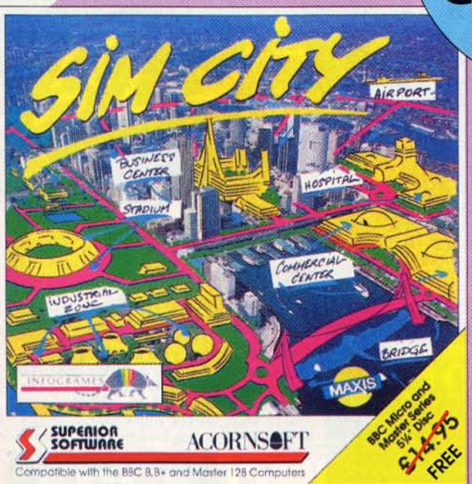
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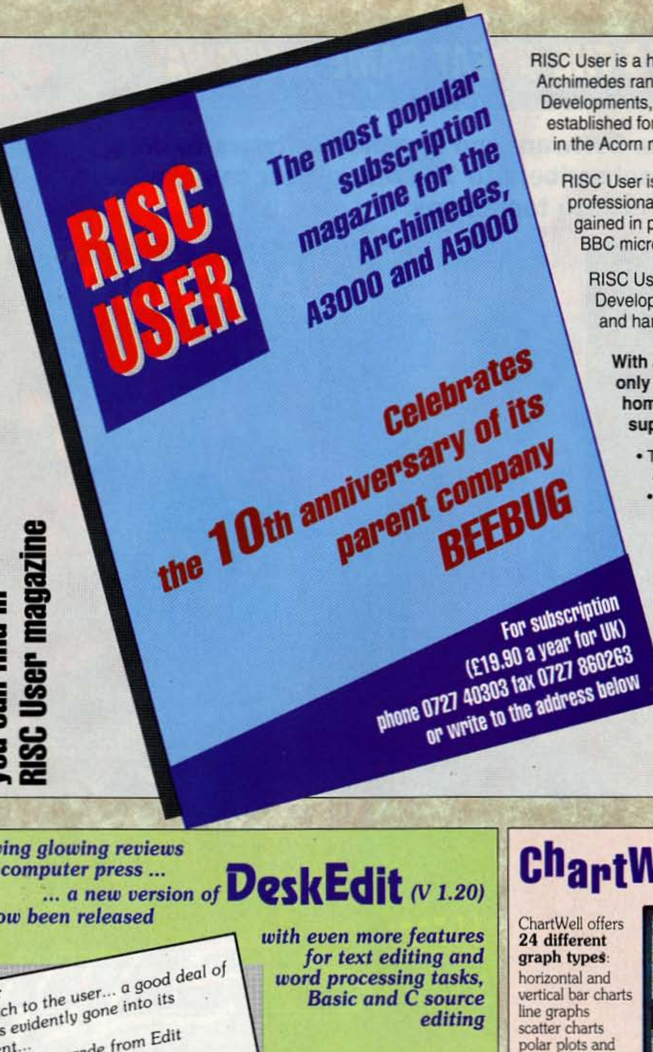

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RISC User is a high quality magazine devoted totally to the Archimedes range of computers. It is published by RISC Developments, formed last year from BEEBUG, which has been established for over ten years as one of the foremost companies in the Acorn market.

RISC User is produced by a dedicated and enthusiastic professional team which benefits from10 years of experience gained in publishing the popular BEEBUG magazine for the BBC micro and the Master 128.

RISC User can also call upon BEEBUG's (now RISC Development's) considerable expertise as a major software and hardware developer for the Archimedes range.

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Following glowing reviews in the computer press ...

... a new version of **DeskEdit** *(V 1.20)*

has now been released

Acorn User

...offers much to the user... a good deal of thought has evidently gone into its development...

... a worthwhile upgrade from Edit

Archimedes World

...replete with well thought out and flexible features... very attractive... remarkably inexpensive for what it offers... should prove very popular.

Archive

...a wonderful piece of software... deserves to be on everyone's icon bar... Acorn would do well to provide it free with every machine it sells... so much (is provided) that you wonder how you managed before.

...macros are...a boon and of great value when writing a program... a truly marvellous set of page and printer control options are included... Everything I wanted was there with clear instructions for use.DeskEdit is a must.

with even more features for text editing and word processing tasks, Basic and C source editing

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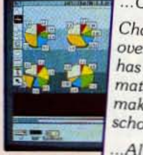

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Acorn User

...ChartWell: simple but effective.

ChartWell scores on simpler controls over the basic graph types. It also has enough effects to present material prettily at a price that makes it attractive to the home or school user.

...All the options chosen can be saved in a 'Style Sheet file which makes it remarkably easy to create the same type of graph again...

Archive

...This program from RISC Developments uses a really clever approach exploiting the desktop philosophy to the full.

Data can be imported from other applications, such as spreadsheets, databases, or created with a suitable editor as a text file. **Output** is in standard Draw format. Use of **'style sheets'** allows a set of options to be saved with data for future reference.

Chartwell and manual **£29.95 inc** +2.00 p&p Code **PCHWa**

RISC Developments & BEEBUG Ltd. 117 Hatfield Road, St Albans, Herts, AL1 4JS. Tel. 0727 40303 Fax 0727 860263

In its prime

PRIMEART from Minerva (0392 437756) is being tested by Devon LEA in all their hospital and special schools. Carole Tudor from the Babbage Centre in Devon has already developed several activities using PrimeArt's facility which allows a sprite to be overlaid with a work area.

This has led the package to be used in language development exercises. An opaque grid is overlaid above a full-screen sprite. By clicking in a square with the plain fill option it makes that square transparent which reveals a portion of the background sprite.

This hopefully leads to group discussion about what has been revealed and which square to uncover next. This should help in the development of communication skills.

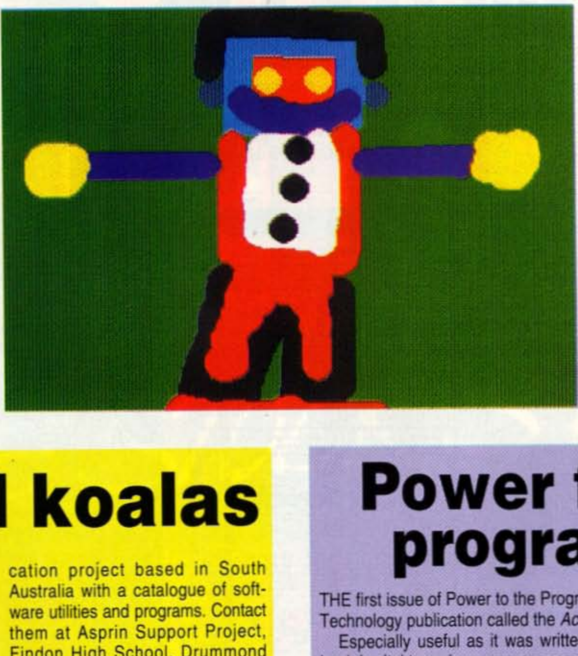
Handwriting skills can be improved by tracing letters displayed on a background sprite working on a transparent foreground while poor motor control can be improved using a maze displayed as a background sprite. The path is then traced with a small coloured brush.

Devon LEA have found the package particularly useful with children who have difficulty holding down the mouse keys because of the sticky menu and brush latching options.

Minerva themselves held a competition earlier in the year which challenged PrimeArt users to create an Easter Card. Due to the quality and quantity of entries it was decided to give three prizes to the under 12 section and award one as highly commended.

Anna Dart (13) from Steps Cross Special School, Kate Barratt (8) from Culmstock Primary School, David Newton (8) from Willand Primary School and Katherine Foxall (11) from Gulworthy County Primary were the winners with Cremona (8) from Ladysmith First School being highly commended.

Each of these children will be presented with a framed copy of the picture with software being donated to their schools.



Designs on drills

THE Arc-PCB, professional and schematics printed circuit board design packages from Silicon Vision (081-861 2173) now have an Excellon driver. This allows the generation of industry-standard Excellon Drill files for driving automatic drilling machines.

Once the drill files have been created they can be sent directly to PCB manufacturers on Archimedes ADFS or MSdos discs. This is claimed to result in a much higher quality of PCB board. The driver software, ExcellonDRILL 1.1 costs £75.

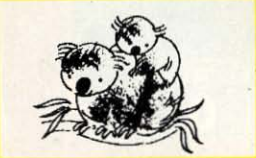
Basic riscs

THE RiscBasic compiler is gathering a varied range of commercial applications under its wing. RiscBasic and the runtime libraries come from Silicon Vision (081-861 2173).

If a compiled program is distributed commercially, all you have to do is acknowledge the use of the compiler and your products benefit from RiscBasic's marketing support.

As well as some of Silicon's own programs, other products include: Arcounts Manager, Avatar, Techtile, Materials Science, Rhapsody and VoxBox.

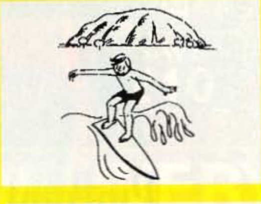
Surf and koalas

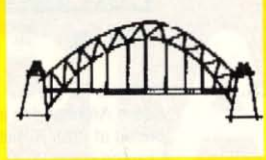


CLIP art is a great way of illustrating all sorts of documents if you don't have any artistic aptitude, and the Asprin Support Project (010 08 457 944) have compiled discs of Australian clip art for the Archimedes – koalas, bark huts, Sydney Opera House, cockatoos and the like.

Nearly 200 illustrations created by professional artists Virginia Barrett and Barbara Cameron-Smith are saved as sprites. Each disc comes with a printout of the contents and costs Australian $20.

Asprin is a joint industry and education project based in South Australia with a catalogue of software utilities and programs. Contact them at Asprin Support Project, Findon High School, Drummond Avenue SA 5023.





Power from the programmers

THE first issue of Power to the Programmers from Coin-Age mentioned a VLSI Technology publication called the *Acorn Risc Machine Family Data Manual*.

Especially useful as it was written by the manufacturers of the chips, this book is vital to serious programmers telling everything you need to know about the Arm chipset – Arm 2, 3, MEMC, VIDC and IOC – so you can typically set up custom screen modes and gain total control of the Archimedes.

However, there was a problem when VLSI realised that their limited stock couldn't meet the demand. Coin-Age came to the rescue by acquiring 100 copies of the book – which had a purchase price of £15 – and they will let true commercial programmers have a copy for the cost of the postage and packing only.

Coin-Age also have some datasheets available. Anyone wanting a copy of either the book or datasheets, should ring Coin-Age on 0282 692688 for further details.

Over 600 copies of the first issue of Power to the Programmers have been sent out and as well as compiling issue two, Coin-Age are working on the feasibility of an ST Emulator for the Archimedes.

This is not straightforward due to the many versions of the ST's TOS roms, timings and copyright and any release is months away yet.

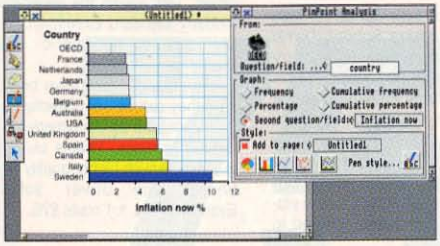
More imminent is an upgrade to Gribbly's Day Out, and the first sighting of Paradroid 90 is due in September. Both are Andrew Braybrook titles initially programmed for the C64, as was Uridium, and later converted to 16-bit format.

Coin-Age have the licence for the updated Archimedes versions, which should be worth waiting for.

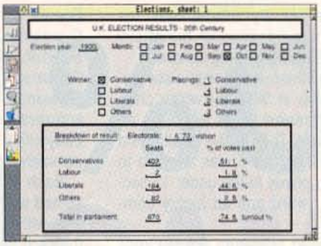
LONGMAN
LOGOTRON

PinPoint

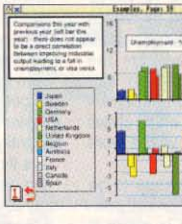
> "The ease with which data collection may be organised and implemented is a joy."
>
> **Frank Jukes, Micro User, January 1992**



(Untitled) •
Country
OECD
France
Netherlands
Japan
Germany
Belgium
Australia
USA
United Kingdom
Spain
Canada
Italy
Sweden
0
2
4
6
8
10
12
Inflation now %
PinPoint Analysis
From:
Question/Field:
country
Graph:
Frequency
Cumulative frequency
Percentage
Cumulative percentage
Second question/field
Inflation now
Style:
Add to page:
Untitled1
Pen style...

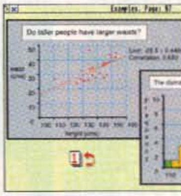


Elections, sheet: 1
U.K. ELECTION RESULTS - 20th Century
Winner:
Conservative
Labour
Liberals
Others
Breakdown of result
Seats
Conservatives
Labour
Liberals
Others
Total in parliament

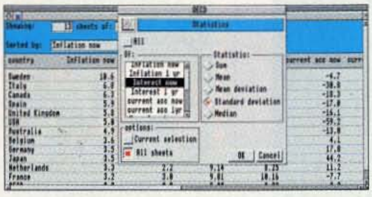


Examples, Page: 10
Unemployment - %
Growth in Industrial Production - %

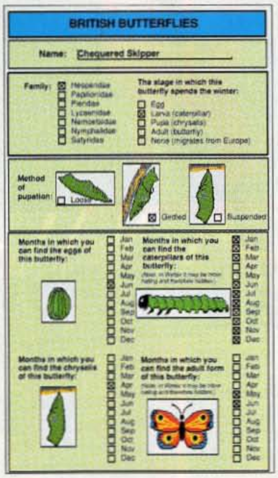
> "*PinPoint* is certainly a new generation database, making the handling of data as easy as it should be. Its concept and execution is brilliant — data handling is about collecting data efficiently, and that is what *PinPoint* does. *PinPoint* is powerful yet simple to use and will take educational data-handling into a new era."
>
> **Dave Futcher, BBC Acorn User December 1991**



Examples, Page: 97
Do taller people have larger waists?
The distribution of heights in cms



Statistics
Inflation now
Mean
Mean deviation
Standard deviation
Median
Current selection
All sheets
OK
Cancel



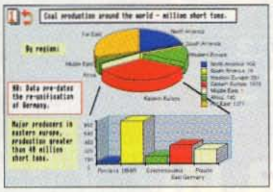
BRITISH BUTTERFLIES
Name: Chequered Skipper
Family:
Hesperiidae
Papilionidae
Pieridae
Lycaenidae
Nemeobiidae
Nymphalidae
Satyridae
The stage in which this butterfly spends the winter:
Egg
Larva (caterpillar)
Pupa (chrysalis)
Adult (butterfly)
None (migrates from Europe)
Method of pupation:
Loose
Girdled
Suspended
Months in which you can find the eggs of this butterfly:
Months in which you can find the caterpillars of this butterfly:
Months in which you can find the chrysalis of this butterfly:
Months in which you can find the adult form of this butterfly:
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

> "Has Longman Logotron developed a new form of database altogether? In one word yes. To call *PinPoint* a mere database, or even mildly more boastful, a new generation database, is to diminish what in truth is a revelation."

> "The scope and variety of *PinPoint* is quite astonishing. The sheer variety, the power, the complexity of this program is astounding. The analysis and display aspects are both powerful and attractive enough to operate in both an educational and business environment. Databases will never be the same after this."
>
> **Duncan Evans, Archimedes World December 1991**

> "*Pinpoint* takes databases into a new dimension in several ways. First, form design. *PinPoint* is about as adaptable as the best desktop publishing package when it comes to creating the form upon which information will later be entered and stored."

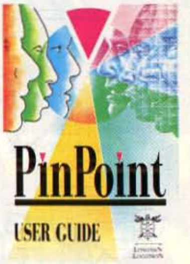
> "When its abilities to produce statistics, charts and diagrams (with more ease and speed than I would have believed possible), and to print the results in attractively designed page format is considered too, then it becomes an essential purchase for anybody wishing to collect, analyse and present information."
>
> **Chris Davies, Times Educational Supplement, November 1991**



Coal production around the world - million short tons.
By region:
NB: Data pre-dates the re-unification of Germany.
Major producers in eastern europe, production greater than 40 million short tons.

Longman Logotron
124 Science Park
Milton Road
Cambridge CB4 4ZS.

Tel. (0223) 425558
Fax (0223) 425349



PinPoint
USER GUIDE

PinPoint for the Acorn Archimedes is priced at £99. A Site Licence costs £400.

JUNIOR
PinPoint
A Child's Guide to Data Handling
LONGMAN LOGOTRON

A special version for primary schools is priced at £24. A Site Licence costs £72.

Biblical winners

THE eighth National Christian Resources Exhibition, held at Sandown Park in Surrey this year, saw the first National Bible-based computer software competition organised by the Evangeltrust.

The overall winner was the Adventure of Elijah, a quiz game written for the Archimedes by father and son team, Chris and Derek Marshall of Wallington, Surrey. Derek commented: "We have learned a lot about this incredible man during the development of the game."

A new Bible software competition was announced at the exhibition with four categories: Individual programmers under 15, sole programmers of any age, group entries from under 15s and group entries of any age.

Full details are available from Evangelsoft who are selling the Adventure of Elijah, at PO Box 224, Kingston upon Thames KT1 2NX.

Acorn Open Days

Acorn and dealers hold regular Open Days all over the country throughout the year. Look out for the ones in your area, it's your chance to talk to Acorn themselves as well as a selection of hardware and software manufacturers. Look in your local press, contact your Acorn dealer or Acorn directly for full details and updates.

Date	Town
Sat/Sun 12-13 Sept	Birmingham
Sat 19 Sept	Portsmouth
Sun 20 Sept	Colchester
Sat 26 Sept	Blackpool
Sun 27 Sept	Oldham
Sat 3 Oct	Bolton
Sun 4 Oct	Sheffield
Sat 10 Oct	St Helens
Sun 11 Oct	Rotherham
Sat 24 Oct	Swindon
Sun 25 Oct	Slough
Sat 31 Oct	Nottingham
Sun 1 Nov	Stoke on Trent
Sat 7 Nov	York
Sun 8 Nov	Northampton
Sat 14 Nov	Middlesborough
Sun 15 Nov	Hull
Sat 28 Nov	Derby
Sun 29 Nov	London (South Mimms)
Sat 12 Dec	Bradford
Sun 13 Dec	Leicester

The Micro User editors will be in attendance at the highlighted shows

It's a breeze

INKJET printers give superb quality, but at a price. Fujitsu (081-573 4444) have extended their inkjet printer range with the new B100. It provides bubble inkjet printing with a draft speed of 160cps and 300dpi for only £349.

This lightweight and compact model measures only 115mm x 342 x 147 and weighs 2.9kg. It emulates the HP Deskjet Plus, IBM Proprinter and Epson FX so driving it from an Archimedes should be no problem.

For a more colourful effect take a look at Hewlett-Packard's (0344 360000) new range of colour inkjets. The HP Paintjet XL300 costs £2,895 and produces 300dpi full colour output up to A3 size.

This machine is the first to feature HP's colour implementation of the HP PCL 5 printer language, the HP PLC 5C.

It offers all the usual features plus colour extensions of text, and faster vector graphics for full colour page description. An Adobe Postscript Level 2 upgrade kit gives integrated authentic PostScript.

The standard PostScript driver will run the latter option and Ace Computing's Tony Cheal tells us that his DeskJet 500C driver should run the new printer as well, as the software is upwards compatible.

Hewlett-Packard believe this is the only PostScript colour printer in this price range with the ability to output on A3 paper.

The PostScript upgrade offers a total of 6Mb of printer memory and can be used with IBM PCs, Apple Macintoshes as well as the Archimedes.

Fujitsu B100

HP Paintjet XL300

Squirrel database gets an upgrade

DIGITAL Services (0705 210600) have significantly upgraded their Squirrel database Version 1.1, which has 42 functional improvements and is to be sent free of charge to all registered users.

Many of the enhancements are in the reporting section where a selection of defaults report layouts are now provided. This lets you access direct reporting, bypassing the Report layout window. Label printing is also available as a default report layout.

If you use text, sprite or drawfiles in your database you should know this version displays these files as the actual item rather than as an icon in the layout window.

Improvements have also been made to the query option. The whole process is now much faster due to a substantial tuning of the Squirrel engine, this being particularly noticeable with relational queries and those containing AND or BEGINS WITH.

In addition you can now save as CSV from a Query and the Filter window has been upgraded to make it more friendly. Wild card searching can now be carried out in multi-line text fields in simple query mode too.

Risc OS 3 has made its impact, and a sense of internationalism has entered the program via the territory module in Risc OS 3.

This allows international dictionary sorting, correct default currency symbols as well as correct thousands decimal point separators in number fields.

Managing the managers

LONGMAN Logotron (0223 425558) are publishing a primary management package for the Archimedes because of its accessibility for the non-specialist and occasional computer user.

PIMS – Primary Information Management System – due for release in September, will cover all aspects of both pupil and staff records, as well as purchasing, budgeting and school accounts. The package is aimed at the needs of the state-maintained primary.

Longman believe that existing systems are not always suitable for the primary schools as most packages are PC-oriented and aimed at secondary schools.

Although the same Archimedes may not be used in both classroom and office there are savings to be had in staff training and maintenance if one type of computer is used throughout a school.

By using its own programmable database, S-Base, Longman are producing a system that will be easy to use and will meet real needs.

The initial specification was developed by Acorn, drawing on advice from primary head teachers, consultants and LEA officials.

The cost of the system has been kept as low as possible and a training manual has been commissioned from Cambridge Education Associates.

Prices aren't set as yet but PIMS will probably cost around £400, including a year's hotline support and maintenance.

Sound on the wires

LEADING Edge (0532 458800) now have a special version of the Sound Sampler and Midi interface card for the Archimedes. The compact device measures only 5.5cm by 7cm.

It has been designed to use the internal Econet expansion socket so it does not use any podule spaces. The Sound Sampler and 16-channel Midi card are installed instead on the Econet network cards. This is particularly useful for A3000 owners as there is only one internal podule.

Sounds can be sampled from a variety of media – CDs, Hi-Fis and TVs – as long as they have a headphone output socket.

All the connections are made via an adapter which plugs into the Econet socket at the rear of the machine. which provides Midi in/out and audio in. The unit costs £93.99 including VAT.

Luton gets Watford

WATFORD Electronics' (0923 237774) impressive new building in Luton is due to open very soon. Not only will the purpose-built shop area include a village devoted to Acorn products, other machines and hardware and software will be supported.

The shop in Watford will continue but the main operations will be moving to Luton, including the research and development wing. Training and conferences will be held on the top floor as well as continuing at the Watford branch.

The magnificent glass frontage is double-glazed, with superb facilities for employers and visitors plus an incredible air conditioning system – every comfort seems to have been catered for.

The new site is easily accessible from the M1, and Watford will be holding one of their famous open days in the autumn utilising the expanded facilities of their new building.

Watford Electronics

Top desk publishing

THE Economist can now be read on CD-Rom. The discs are distributed by Chadwyck-Healey (0223 311479) and two are available now – 1987-1990 and January 1991-March 1992. Updates to the 1992 disc will be released in July, October and January.

These discs contain the articles and comment from the Economist, and graphics and an index are included from January 1991. FT Profile, the producers, are planning to release earlier years in archived format.

Archival discs cost £1,090 with current year discs priced at £690. If you opt for a subscription for 1993 you'll only pay £395. The discs are in PC format so you'll need a PC Emulator or board with CD-Rom driver to access them.

I-APL group move

THE I-APL, the group who distribute the APL language, have moved to 11 Auburn Road, Redland, Bristol BS6 6LS. This society of users and programmers has been expanding the base of APL and J.

Anyone interested in the Archimedes version of APL can obtain a copy of the disc and manual for £11 from: I-APL, 56 The Crescent, Milton, Weston-super-Mare, Avon BS22 8DU.

J is also available for the Archimedes for £16. A host of general books are on sale, too. I-APL is also available for the BBC Micro.

Competition successes

LUCKY T.D. Clarke from Bestwood in Nottingham has won a winter weekend trip to Paris for four to enjoy the wonders of the EuroDisney resort in the *Micro User* competition sponsored by Hybrid Technology and Superior Software. There was also a vast range of other prizes.

For five Archimedes owners there was a copy of Superior's Air Supremacy: Timothy Munt, Camberley; P. Birah, Hayes; Liakat Khan, Ilford; David McEwen, Cricklewood and Charles Sowden from Mauldon.

Staying in the air, Hybrid found five other readers worthy of a copy of Archimedes Elite: Tony Shew, Rochester; Simon Kendrew, Haxby; Gareth Curtis, Hawkwell; Paul Lackley, Didsbury and E. Porter from Neath.

BBC Micro, Master and Electron owners also shared in the bounty with a choice of two Superior games. These are now wending their way to Fadzil Jamawdin, Aston; D. Mengella, Great Smeaton; Edwin Hammer, Worcester; Jamie Radford, Uplands; Simon Collett, Swindon; William Keown, Keadby; J. Davies, Kingston-upon-Thames; Angela Bibb, New Malden; D. de Ste Croix, St John and David Benson from New Market.

A third prize of Elite T-shirts and sweatshirts as well as Superior T-shirts and Repton mugs were awarded to David Marston, RAF Guetersloh; A.M. Searle-Jones, Droitwich; Tom Hodgson, Chester-le-Street; Gurvinder Singh Ari, Edmonton; Dominic King, Combe Down; E. Hailstone, Over Wallop; Matthew Ekman, Grantham; Mark Wheeler, Bristol; I. Woods, Canvey Island; Steven Rajam, Sale; Chris Bell, Swinshead; David Sloan, Leyland; D. Toms, New Milton; Osmond Green, London; Ewen Ferguson, Belfast; Stephen Blenkinsop, Liverpool; Dean Alexandrou, Colindale; Andrew Weston, Stoke on Trent; Adam Lucas, Cotham; John Shepherd, Istead Rise; Christopher Hopkins, Loughborough; Peter Garden, Liverpool; Daniel Whymark, Bordon; Charles Fox, Sheffield; A. Elliot, Hemel Hempstead; Mark Scholes, Bulwell; G. E. Smithies, Preston; Nia Peris, Caernarfon; Marc Bartlett, Clifton; Joe Garrity, Norwich; Robert Pfeifer, Rhydycroesaw; Daniel Dench, Belvedere; A. J. Litchfield, Romford; S. J. Dawes, Staunton; Andrew Houghton, Prescot; Andrew Snodgras, Ayrshire; Arthur Harvey, Uxbridge; S. France, St Peter Port; Shanaka Thilakawardhana, Swindon; I. Holgate, Flitwich and J. K. Spry from Walderslade.

In addition prizes of Elite posters are in the post to the runners-up.

NW Semerc sponsored a competition with an education bias in our April issue which brought a massive response. Laura Gallagher from Bradford; Isaac Shaffer, East Didsbury and Chris James from Ticknall near Derby have each won an Oldham Overlay Keyboard.

Fun and games came with Top Banana word search competition, in which contestants had to demonstrate their knowledge of the environment. The first 10 correct entries pulled from the sack were: J. A. Steadman, Retford; Morag Hughson, Unst; M. Adams, Prestwood; Ian Shaw, Enfield; Rebecca Halus, Egham; W. J. Mahoney, London; Robert Carter, Doncaster; Chris Hinds, Camberley; Brendan Payne, Amersham and Aidan Reid from Netherton.

They will all be receiving a Top Banana Pack which consists of a copy of the Archimedes game, a T-shirt, video and a single of the music composed using chaos theory.

There are also 25 runners-up prizes of a Top Banana T-shirt going to: T. D. Gamlin, Bristol; Christopher Hall, Tilehurst; Ian Fetherstone, Bishop Auckland; Ralph Sillett, Penkridge; David Morgan, Dyfed; Paul Chamberlain, Ilkley; Richard Bates, Burntwood; Jamie Hutchinson, Ilford; John Muir, Glasgow, H. Knott, Lewes; E. Woodham, Worcester Park; M. Evans, Bristol; Dominic Storey, St Helens; Sam Willmott, London; Tim Hardwick, Martock; J. Wills, Southam; Patrick McIntyre, Cwmduad; Victor Shears, Maidstone; Alex Howarth, Crediton; Daniel Sherwood, Milton Keynes; Roger Wright, Sidcup; Toby Bryans, Wembley Park; J. Davis, Wakefield; Guy Verbist, Edinburgh and Jeremy Lee from Upminster.

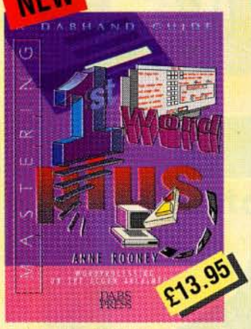
ESSENTIAL READING MATERIAL FOR THE ACORN ARCHIMEDES *from*

DABS PRESS

THE PREMIER ACORN BOOK PUBLISHER

061-773 8632

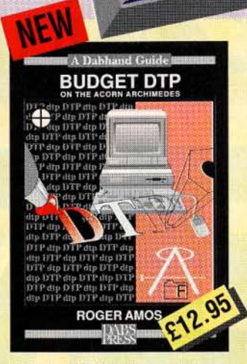
Offices: 22 Warwick St, Prestwich, Manchester M25 7HN. Tel: 061-773 8632. Fax: 061-773 8290.
Proprietor: David Atherton. All prices include VAT (0% on books), and UK postage. Access/Visa accepted. Foreign add £2.50 surface, £12 air.



A step-by-step guide that takes you through all the features of 1st Word Plus on the Archimedes, from installation to mail-merge, Mastering 1st Word Plus is comprehensive, thorough and easy to read.

Includes:

- *How to use a word-processor*
- *How to type, edit, style and layout text*
- *Using graphics*
- *Using 1st Mail*
- *Using 1st Word Plus with other applications*



"using the bright & brash approach of Roger Amos"

"a book that any impoverished but enthusiastic publisher, should not be without"

Jerry Glenwright - ACORN USER

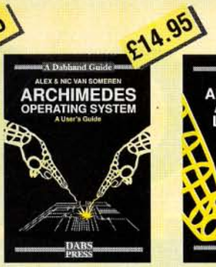
"offers all the help you will need to get you producing DTP documents on a shoestring"

"For the paltry sum of £12.95 this book could well save you over £100"

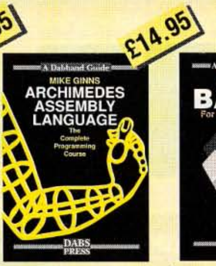
Paul Gaunt - ARCHIMEDES WORLD

£9.95
A Dabhand Guide
ANNE ROONEY
ARCHIMEDES
FIRST STEPS
DABS PRESS

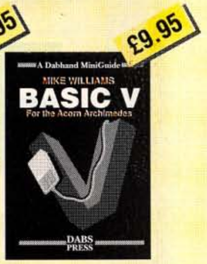
Introductory book for the Arc, covering the basic operations and use of !Edit, !Draw, etc.



Useful summary of OS information with detailed examples. (£21.95) with disc.



The only tutorial and reference on ARM assembler on the market, with many RISC OS examples. (£21.95 with disc.)



A practical guide to programming in BASIC V on the Acorn Archimedes, with a wealth of easy-to-follow examples.

BBC SOFTWARE

Hyperdriver

The ultimate printer driver ROM, with over 80 commands, a built-in NLQ character set, WYSIWIG previewing, access from View, Wordwise, Interword or BASIC. 100 page manual. For B/B+/E/M/C. Price £29.95 ROM, £24.95 disc for SRAM.

Minidriver

As HyperDriver but for Mini Office II. Includes Viewdata terminal. £24.95 ROM. SRAM version £19.95.

Mos Plus

Utility ROM for Master 128s only fixing EDIT and CLOSE#0 bugs, ADFS format, verify and backup in ROM, backup/compacting in SRAM, alarm clock and configurable startup facility and much more. Price £12.95 ROM, £7.95 SRAM.

Sidewriter

Pop-up notepad for SRAM users (any SRAM machine), works with any software. Price £7.95.

Assembler Bundle

Two Bruce Smith books on 6502 assembler with discs and Master Series update booklet. For B/B+/E/M/C/ RRP over £30, yours for £4.95!

Fingerprint

SRAM or main memory 6502 machine code monitor/disassembler/memory editor. For B/B+/E/M/C/ Price £9.95.

Conversion Kit

Ready-made 6502 assembler routines, for learning or development. Price £7.95

BBC BOOKS

View Dabhand Guide

Bruce Smith's comprehensive guide to View wordprocessor. "For those who want a complete thorough and readable guide to View, then Bruce Smith is your man" (Beebug). £12.95 or £17.95 with disc.

Master Operating System

David Atherton's definitive reference work including the famous 'differences between all eight-bit models' section used by countless programmers to ensure compatibility across the full eight-bit range. £12.95 or £17.95 with disc.

Mini Office II Guide

Detailed tutorial by Bruce Smith and Robin Burton for the BBC/Master versions of the software. Price £9.95 or £14.95 with disc.

Mastering Interpreters and Compilers

Fascinating Bruce Smith title on creating high level languages. £14.95 with free disc.

MASTER 512

Master 512 User Guide

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Master 512 Technical Guide

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OTHER BOOKS

Z88: A Dabhand Guide

Introduction to the Z88, by the designers of the machines own software. £14.95

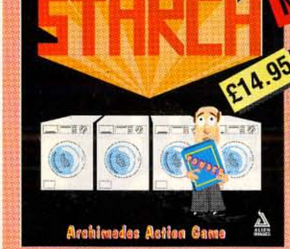
Z88 Pipedream Guide

John Allen's detailed work on all aspects of Z88 PipeDream. Good explanations of printing. Price £14.95

Psion LZ OPL Guide

Ian Sinclair's guide to OPL programming on the LZ series of Organiser machines. £12.95

Games Action from Alien Images



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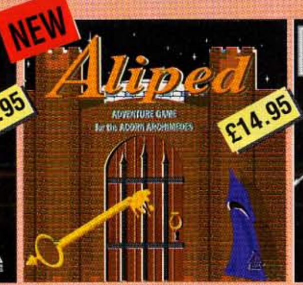

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Object of interest

Steve Bruntlett investigates a new drawing package

Product: Vector
Price: £85
Supplier: 4Mation, 14 Castle Park Road, Barnstaple, Devon EX32 8PA.
Tel: 0271 25353
Requirements: Risc OS

IF YOU'VE ever used DrawPlus for any kind of art or graphics work on the Archimedes you may think you'd know what to expect from Vector but prepare to be surprised.

Written by the author of DrawPlus, Jonathan Marten, it's not an upgrade but rather a highly developed version with a new look but familiar feel in terms of operation and plenty of new features not currently available in any other package.

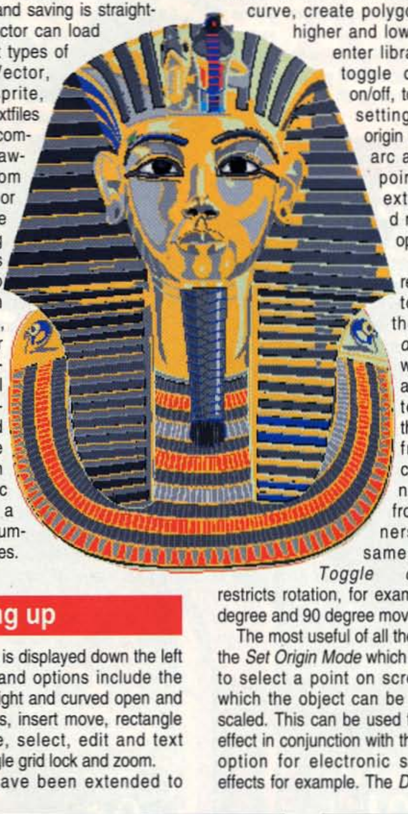
Vector comes on two discs: One containing the application the other holding 19 libraries of drawfiles such as banners, bubbles, arrows, doors, weather and safety symbols and two libraries of Skeletons.

It also contains tutorial files on the use of colour, layers, paths, special and miscellaneous features. These are well worth working through to start with as they give clearly worked examples of features such as the use of skeletons and replication. They also form a clear guide to Vector's most powerful features.

The program is run in the usual manner with a Portrait A4 default window. You are advised to set a page size before you start work and the default can be changed to a wide range of ISO – A4 and its relatives – or ANSI paper sizes in either horizontal or vertical format.

If you change your mind about paper size or orientation a *Tidy objects* option will bring everything inside the current sheet margin. This combined with the *Print Setup* box gives you total control of the working area and printing out.

Loading and saving is straightforward. Vector can load six different types of files: Vector, Poster, sprite, draw and textfiles as well as compressed drawfiles from Chameleon or Vector. The saving options allow you to save in Vector, Draw or Poster formats as well as in compressed drawfile form with automatic save in a specified number of minutes.



Tooling up

The toolbox is displayed down the left hand side and options include the familiar straight and curved open and closed paths, insert move, rectangle and ellipse, select, edit and text modes, toggle grid lock and zoom.

These have been extended to include create arc, create 4-point curve, create polygon, select higher and lower layers, enter library mode, toggle constraint on/off, toggle drag setting and set origin mode. The arc and the 4-point curve extend the drawing options.

The really useful tools are the *Toggle drag setting* which allows you to rescale the drawing from one corner as normal or from all corners at the same time. *Toggle constraint* restricts rotation, for example, to 45 degree and 90 degree moves.

The most useful of all these tools is the *Set Origin Mode* which allows you to select a point on screen about which the object can be rotated or scaled. This can be used to powerful effect in conjunction with the replicate option for electronic spirograph effects for example. The *Display* submenu is divided into four sections, the first of which deals with *Zoom* options.

These have been greatly simplified by using a set of percentage values incrementing from 5 to 2000 per cent and the page up and down keys.

The current magnification is shown in the Vector status window beneath the title bar. The *Full View* or *Home* options show the whole of the drawing.

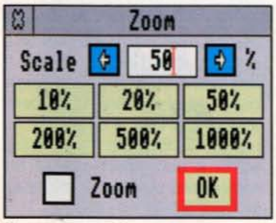
On display

The *Drag* options have been dealt with but the *Display* submenus warrant some investigation. *Show status* switches the status window on or off. *Show tools* and *Show rulers* do a similar job with the toolbox and rulers.

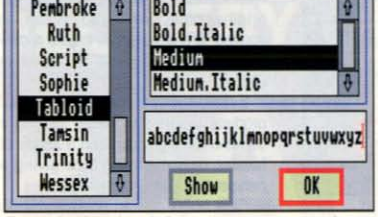
Show palette brings up the palette for the drawing. *Auto scroll*, if set, means that the window is automatically scrolled as you approach the edge of the visible drawing space. Very useful.

A whole range of Path objects can be created and edited. Arc is used by clicking Select where the arc is to start, clicking again to define its centre and dragging the resulting rubber-banded line around to where the arc is to end and double clicking to complete.

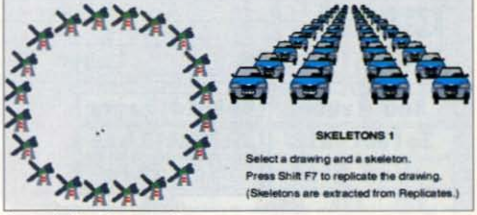
Four point curves are the electronic equivalent of flexicurves. They are, in effect, single curves with two control



The zoom control box



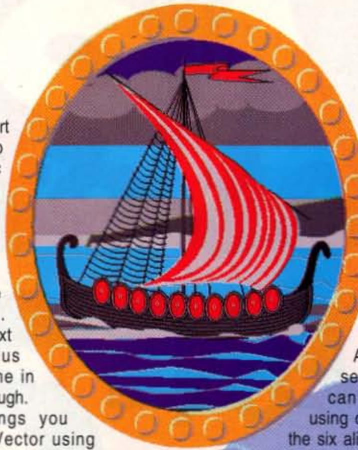
Font and style option window



SKELETONS 1

Select a drawing and a skeleton.
Press Shift F7 to replicate the drawing.
(Skeletons are extracted from Replicates.)

Some skeleton demonstrations



points allowing you to produce simple bezier curves. These can also be daisy-chained using Adjust rather than Select at the end of the curve.

Making changes

The editing facilities are an improvement on Draw Plus with the inclusion of a very useful facility to add points to the end of lines rather than having to create extra mid points and shuffle them around in a rather laborious and inaccurate manner.

The *Segment* option allows you to change the co-ordinates of the currently selected point for editing as well which is very useful for precise placement.

The main improvements are in terms of colour handling and the application of styles from one object to another. A colour dialogue box is used for both line and fill colours as well as text colour with a 16-colour default palette.

But if you click on any of the other three options while in a 256-colour mode you start to get the same benefits in terms of colour as you may have previously experienced in Chameleon and now in Chameleon 2.

Selecting objects is easier and more accurate as you use the cursor keys. If the selected object is narrower than a select box *ear* its area of sensitivity is extended – shown by a yellow rectangle – making it easier to select very narrow objects such as thin vertical or horizontal lines.

An *Object order* box allows you to move objects backwards or forwards in a drawing by a specified number of steps.

Creating text objects is quite straightforward but the main problem with Vector is that unless you have Risc OS 3 you can't use the *Text to Path* to convert text into graphic objects for further manipulation or dropping into packages like Impression 2. Converting text in DrawPlus could be done in Risc OS 2 though.

Other things you can't do in Vector using Risc OS 2 include dithering in 16-colour modes, kerning, rotation of sprites and flipping or rotating lines of text.

Come on Acorn, when are the other 98 per cent of your users going to get their hands on Risc OS 3?

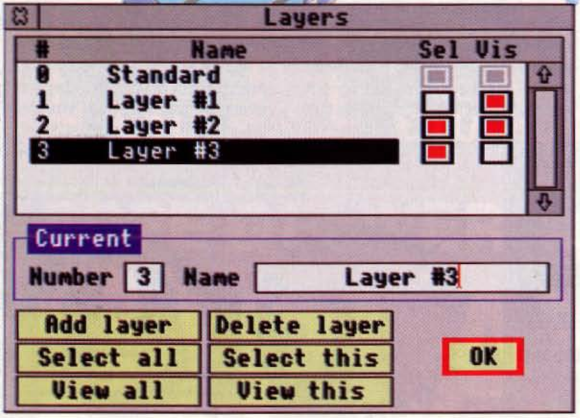
Enhancements

The handbook explains very clearly how to arrange objects and deals with scaling by dragging in a clear series of diagrams showing the effects of *Constraint on/off* and *Corner/Centre to corner drag*.

To put it simply, *Constraint on* keeps an object proportional when scaled and *Centre to corner drag* leaves the centre of the object in the same place while scaling the object using the ears of the bounding box.

Scale and *Transform* can be carried out precisely using the *Overall* option to change the whole object or the selective option to alter the horizontal, vertical and line dimensions independently.

The *Snap to grid* box allows you to snap different parts of an object's bounding box to the grid, while *Size and Position* allow width and height values to be entered for a selected object. Rotating and Skewing can be carried out precisely using the appropriate dialogue box.



#	Name	Sel	Vis
0	Standard	☐	☐
1	Layer #1	☐	☒
2	Layer #2	☒	☒
3	Layer #3	☒	☐

Current

Number 3 Name Layer #3

The layers dialogue box allows you to control visibility and workability

Any number of selected objects can be aligned using combinations of the six alignment buttons controlling Left/Right, Top/Bottom and Horizontal/Vertical centre positions. Three or more selected objects can be distributed using a dialogue box similar to the previous one.

Space allows equal spaces to be placed round three or more selected objects. *Pack* moves two or more selected objects so that no spaces exist between them.

Rulers can be toggled on and off but can also be set changed using the *Rulers* dialogue box. Scaled rulers can be set up and the grid fully defined using the options provided to produce rectangular or isometric points or lines. The chosen units can also be applied to objects in the current library.

The *Origin for Ruler* dialogue box allows you to have the origin anywhere on screen, for example at the centre of the screen for symmetrical documents and also if you are using the Origin rotate and scale options.

With *Replicate* you can copy any object or group of objects as regularly spaced identical copies, as a set of *Static replications* where altering the original alters all copies simultaneously and finally as *Dynamic replications* which can be altered independently of the original.

These last two options greatly reduce the amount of space used in storing multiples of original objects but they can't be used in other programs.

The *Radiate* facility allows you to replicate a path by rotating it about a fixed point. Skeletons are perhaps one of the most exciting developments of Vector. The handbook describes a Skeleton as an empty Replicate, one which has had the original object removed. It can be applied to any object to create a new replicate and can be Dynamic or Static.

Essentially it means that you can produce a series or boxes forming a frame or arranged to form a series of frames of decreasing size giving a perspective effect for example.

The *Mask* option allows a path object to provide a mask over another object. It allows an object to be filled with another object rather than a colour.

The procedure is intuitive and requires you to select the object to be masked and the path object which will be the mask. Position one over the other and select both before choosing the Mask option and you'll get a result like the one here.

Layers can be created to keep parts of the drawing separate. These can be turned on and off in terms of visibility and workability allowing you to use an underlying image for your work turning it off prior to printing out for example.

Another welcome facility in Vector is the use of Libraries to store and display components without having to load them individually from disc every time you want one. You can also use it to store finished work.

Finished copy

Just as Vector borrows its colour options from Chameleon so it also borrows and develops its printing options from Poster.

The *Print Setup* dialogue box allows you to change the print scale, change the orientation and position of printing, printing on a given number of sheets as well as changing the order or selecting single sheets from multiple prints.

It may be worth buying Vector for this one feature alone as it gives you total control over printing anything you can load into Vector.

The *Print* box gives you control over manual feeding, collation and order. The *Preferences* option box allows you to change the colours of points, boxes and so on as well as setting default options for paper size, merging and so on.

The seven appendices in the handbook cover useful techniques, exclusive features, memory economies, isometric projection, text area commands and keyboard shortcuts.

Summing up

This is a superb package which anyone who is at all serious about drawing or producing graphics on a computer should buy immediately. It may seem expensive for a single copy, especially after having been able to get hold of DrawPlus for next to nothing. But it's definitely worth it and especially so for schools and colleges for the usual inclusive 4Mation site licence.

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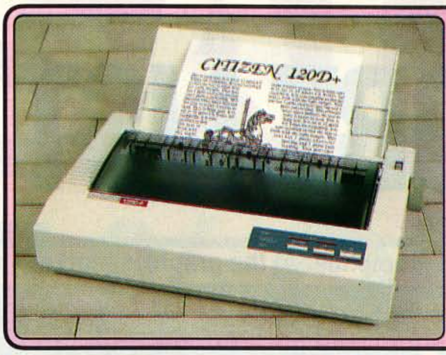

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Tel: 0983 294333
Requirements: Risc OS

ONE area of computer use that's well supplied for the 32-bit micros is commercial graphics programs. There's Artisan 2, Pro-Artisan, Arcol, Atelier, Revelation 2 and so on, but most of these cost over £50. Here's a new contender that's more competitively priced, but how does it stand up?

The main problem with programs that deal in bit-mapped graphics is that almost all access the screen directly, for speed – Revelation is the main exception. But because of this the authors invent their own tool selection and menu systems. Sprite Editor is no exception.

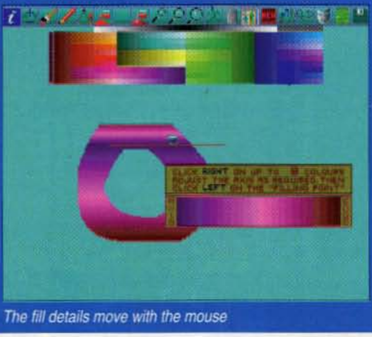
The program sits on the iconbar until clicked when the screen is switched to the mode it's set up for (13 or 15) and you're presented with a title screen. This gives four options: Return to Desktop, access the instructions, go to the edit screen and edit user defined characters.

A magnifying glass is attached to the pointer which you can move around the screen – watch out for the little sprites, they came as a delightful surprise when I saw the first one.

When you enter the sprite editor proper there's a long menu bar with at least 15 icons and below it a colour palette containing graduated tints rather than the usual hotch-potch mix – Atelier excluded. The Menu bar is on screen the whole time apart from when you're actually drawing.

Mouse button usage is weird: Menu is okay as it just moves the menu to the current mouse position. Select is for drawing only, while Adjust is purely for menu and palette selections. I found it very irritating.

The programmers clearly aimed to give lots of help. For example the pointer is accompanied by extra information when over the menu bar and palette. Over each icon text appears to inform you what the icon is, and when you click over a colour you're informed of the colour number and tint – as you might use from Basic.


The fill details move with the mouse

While the icon information might be handy at first – although the colour numbers seem completely redundant – after a time it just clutters the screen and tends to distract.

Worse still, the graduated fills – good though they are – allow you to specify exactly what colours will make up the fill, but the colour information is carried along with the pointer as well! It's just too much.

There's no manual as such but an online help facility is available at all times – I found it unhelpful except for the simplest operations. The pointer information is obviously designed to compensate but it doesn't help in actual use.

The user-defined character editor is a curious thing. It allows you to define 12 characters and you can animate them to see how they look. You can also set up multiple colour characters by overlaying one on another.

The character definition codes can be copied out to another program but as it's not multi-tasking you can't do it on the Desktop.

This is a potentially powerful package if you can spend the time learning how to unleash that power and ignoring the distractions. It's a good attempt but the execution leaves a lot to be desired.

Mega Utils: A inexpensive collection, simple to use and multitasking

Product: MegaUtils
Price: £10
Supplier: Desktop Projects, Unit 2a, Heapriding
Business Park, Ford Street, Stockport SK3 0BT.
Tel: 061-474 0778
Requirements: Risc OS

UTILITIES come into two categories: Those you never need until there's an emergency, or some specific applications which don't take up much space but are so useful that you wonder how you managed without them.

Desktop Projects have an inexpensive collection of 11 such programs which are all simple to use and fully multi-tasking. Most are self-explanatory but all have a help file anyway.

AddrBook, not surprisingly, is a simple address system that records names, addresses and phone numbers. You can browse through your entries, edit or search. The files are saved as text so they can be imported into other programs which is a nice touch.

A short-cut search facility uses the on-screen alphabet pad. When you select a letter the first record beginning with that letter is displayed. Click the same letter again to cycle through the entries starting with that letter.

If you press the menu button over a letter you are shown a menu of matches giving the name and telephone with the option to display the complete record in the main window.

This sorts on the last name entered, so if you enter Acme Production Ltd it will be on the alphabet matrix as L not A. Because of this it is good for personal contacts but can be a little awkward when you want to use it for organisations.

Of a similar ilk is **Diary** which again sits on the iconbar and can store several comments each day. When installed the current month is shown in a window with the appropriate saved notes which you can search or save as a textfile. All notes are saved when you move on to another record.

Especially useful is the Important icon that marks the currently selected day as important and can be found by choosing the Important option from the Diary menu. Each day so marked will be shown in chronological order from the current date.

In the !Run file is a variable you can change to allow automatic searching of important days on boot-up. Full details on how to set this up are given in the Help file.

CleanUp forces your Archimedes to redraw selected windows or the whole screen via two sets of hot keys. Pressing F12 and Return is just as effective when you run into a program which doesn't work or messes up your windows or even when a non-multi-tasking program has dirtied the screen.

Disable is a must for schools and exhibitions as it refuses to let anyone wipe or delete a file.

DosForm has a self-obvious title for a program which uses the standard floppy drive to format and verify any disc to 720k Dos media.

Apart from being the name of the collection **MegaUtils** is also the name of one of the programs and is a suite of programs within a suite.

Starting with File Utilities this transfers Basic programs into the Basic editor by holding down the Alt key while double-clicking on the file or you can reverse the process. Holding down Alt will also transfer any non-Basic file into Edit so that it can be read. MegaUtils is a little confusing in design as the

Type Studio: Distorted words

Product: TypeStudio
Price: £45
Supplier: RISC Developments Ltd.,
117 Hatfield Road, St. Albans,
Herts AL1 4JS.
Tel: 0727 40303
Requirements: Risc OS

AN ever-growing number of graphic manipulation packages is becoming available for the 32-bit Acorn machines, of which TypeStudio is one of the leading lights.

It comes in a simple box with a very nice manual of about 60 pages. The software is on two discs, one containing the program, system and a directory full of examples, the other with four additional fonts and examples from the manual.

The manual is divided into a start-up section which deals with installation, a tutorial that takes you through all the major parts of the program and a final reference section which goes through each item in detail.

In use TypeStudio is like half of Draw with extra bits tagged on the end. Unfortunately it also lacks the key equivalents of DrawPlus and Risc OS 3 Draw, which means that fast copying, grouping, ungrouping and deletion just aren't available.

It's a relatively simple addition that would make a lot of difference. However, the interface as a whole is satisfactory. For example to create a piece of slanted text involves drawing a line, selecting it, converting it to a path with a simple menu click, entering the text and bingo.

Text can be flowed along straight or curved lines or, using two lines, can be placed into a mould. Although this will most often be used for text, in fact, any Draw object can be treated in this way.

Once an object has been applied to a path or mould it cannot be re-formed to its original shape – unlike Poster where the original information is preserved. However, it's no problem to keep the original and work on a copy.

Apart from paths and moulds, various other effects can be applied: Shadowing – floor, wall and graduated, slanting, mirroring, creating a 3D version or putting a plinth around something.

More than one effect can be applied simultaneously but to remove the effect the objects must be ungrouped and the new parts that create the effect must be deleted.

TypeStudio is quite versatile and has many operations. It's not the easiest package to use but the manual is very thorough and will hold your hand through all the examples.

Tiler: Printing sprites at any size

Product: Tiler
Price: £10
Supplier: Desktop Projects Ltd., Unit
2A, Heapriding Business Park,
Ford Street, Stockport SK3 0BT.
Tel: 061-474 0778
Requirements: Risc OS

THE biggest problem with printers is outputting a picture that's bigger than the paper size. Usually the only solution is to compromise with a smaller picture or lose pieces.

4Mation's Poster solved the problem by automatically *tiling* the drawing and printing out on to several sheets complete with cut marks. But because Poster provides lots of other facilities it is expensive.

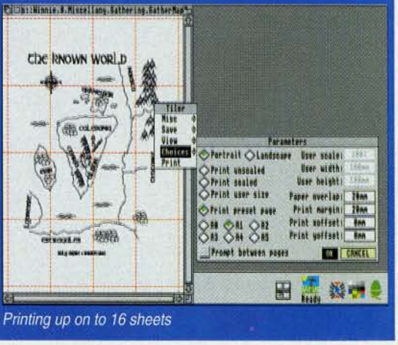
Tiler, from Bright Ideas, will print a Draw file or sprite at any size and tile it if necessary – and that's all it does.

Run Tiler as normal and it appears on the icon bar. Dragging the required file to it results in it being displayed with the cut marks in red. Now you can set various options to control the display and output size.

The onscreen size can be scaled to fit vertically, horizontally, halved, doubled and so on – the most likely you'll choose is one of the *scale to fit* options. Then you can go to the print options.

Here you control the absolute size of the final image. You can specify that it fits a standard page size from A5 up to A0, or a specific size can be applied although the image is not distorted to fit exactly. Alternatively a particular scaling factor can be used to determine the print size (10 per cent, 120 per cent and so on), or finally you can simply set it to unscaled which will print at the standard size.

And then you just print – it may take a while but it works. This is a very simple program that achieves a definite result at a reasonable price and does the job well.



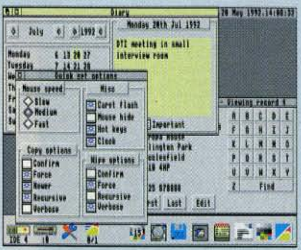
Parameters

● Portrait ○ Landscape
○ Print unscaled
○ Print scaled
○ Print user size
● Print preset page
○ A0 ● A1 ○ A2
○ A3 ○ A4 ○ A5
☐ Prompt between pages

User scale:
User width:
User height:
Paper overlap: 20mm
Print margin: 20mm
Print xoffset: 0mm
Print yoffset: 0mm

OK CANCEL

Printing up on to 16 sheets



DTI meeting in small interview room

Quick set options

Mouse speed
○ Slow
● Medium
○ Fast

Misc
☑ Caret flash
☐ Mouse hide
☑ Hot keys
☑ Clock

Copy options
☐ Confirm
☑ Force
☑ Newer
☑ Recursive
☐ Verbose

Wipe options
☐ Confirm
☑ Force
☐ Recursive
☑ Verbose

Loads of utilities from MegaUtils

menu gives you options for a flashing caret, hiding the mouse, having a clock or hotkeys – a full list is given in the Help file.

But you can also choose these via Select which also gives you access to change the mouse speed, choose between five copy and wipe operations – recursive, confirm, verbose, newer and force.

In addition to these customisations you can also change the type of a file. The current filetype is shown and there is a list of standard filetypes shown via a menu.

For the tidy minded take a look at Arrange where filer and applications windows can be set up in different ways. If you select Organise each window is displayed as the same size and tiled, Pile puts the windows in columns with the title bar showing, while Slope is similar but the columns are sloped.

There is an option to exclude certain windows and the Rotate options let you change the order of the stacks. A nice addition is the Close option which closes all windows selected in Arrange.

Utilities are also synonymous with saving time and **QuickRun** allows you to drop files or directories on to the icon. This adds the names to a list and the number of programs held is shown under the icon – to a maximum of 50.

Press Select on the iconbar icon and you'll bring up a menu of all the programs contained in QuickRun. Pressing Select again on one of these will open it. Programs can be set to auto run and a tick is placed by any this applies to.

You can have more than one list of files which can be edited, loaded and saved as you require. It is quite a useful little program, especially if a group of people are using the same machine with different applications.

On the other hand if you use a range of applications which mean that you are always changing mode take a look at **QuickMode**. This simply sits on the iconbar displaying the current mode. You can select from modes 12, 15, 20, 21, 77, 78, 79, 98, 101 and 102 if you have the relevant modules, or change the choices or alter the palette to default, grey, user or an inverted form.

The Adjust button gives you information about the currently selected mode. If you need to select a mode which you do not use frequently this can be selected from the User Mode option from the Quickmode menu.

LineClock sits in the top corners of your screen. Select and Adjust will alter the display between the time, time and date and just date.

Last must not least is **FileMon**, which monitors a file's status – size, filetype, access and date.

All in all this selection of programs is extremely good value for money. You may not need them all but at this price it's worth putting them into your library anyway.

by Jonathan Marten
the author of DrawPlus

Vector

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drawing
package

Vector's wealth of features includes:

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- An additional unique palette for each document
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- Undeleting of deleted objects
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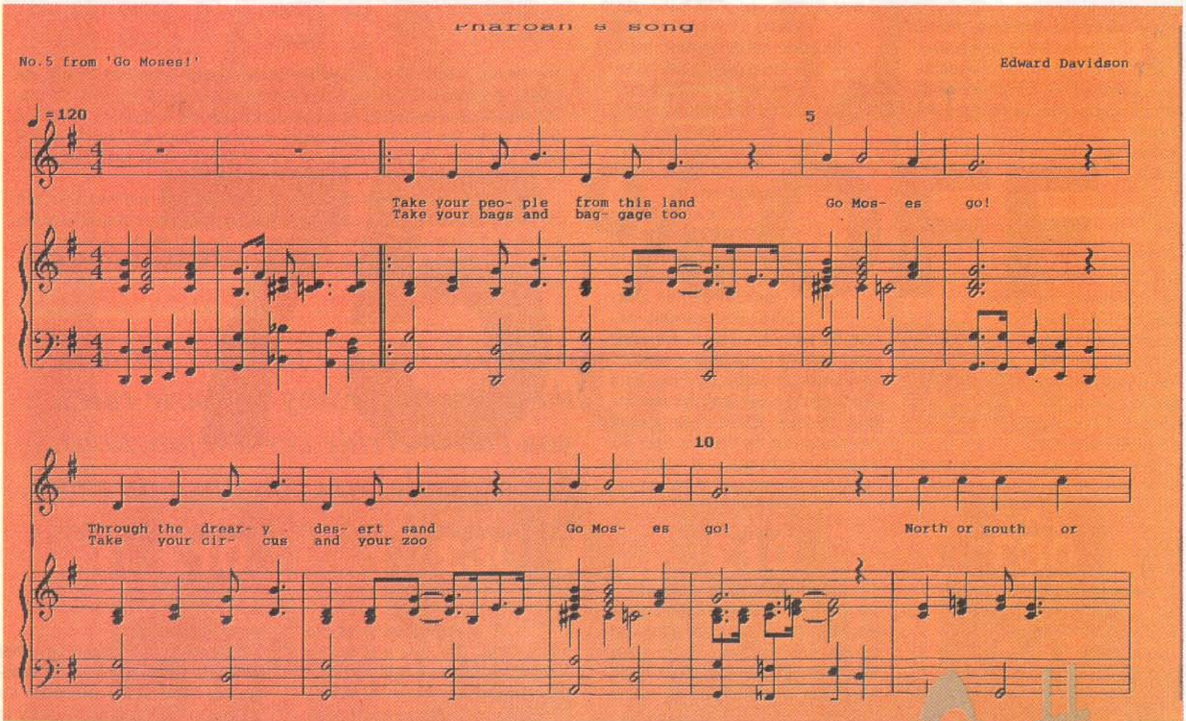
Pharoah's song
No.5 from 'Go Moses!'
Edward Davidson
♩=120
5
Take your peo- ple from this land
Take your bags and bag- gage too
Go Mos- es go!
10
Through the drear- y des- ert sand
Take your cir- cus and your zoo
Go Mos- es go!
North or south or

Scoring top marks

Ian Waugh examines a new way of writing sheet music on the 8-bit range

Product: Music Publisher
Price: £59
Supplier: Hybrid Technology,
88 Butt Lane, Milton,
Cambridge, CB4 6DG.
Tel: 0223 861522
Requirements: BBC Micro B, B+, Master with Epson graphics compatible printer

THE purpose of a scorewriter is to take your musical input – notes and rests and so on – and format it into a printable score. Scorewriters are often referred to as the musical equivalent of a wordprocessor but their job is much trickier.

Unlike a wordprocessor, the formatting of music is much more complex than the formatting of text. In a musical score 50 per cent is the notes and rests, the remainder is the layout, formatting and presentation.

The formatting of a score is a tricky business – the spacing, stem direction, beaming, rhythmic alignment of notes and the positioning of auxiliary symbols, for example, must all be correct if the score is to look right.

Even such things as turning note heads around to avoid overlaps between adjacent notes is vital – referred to as seconds which are the scorewriting equivalent of kerning.

One of the main reasons for using a scorewriter is so the program can take care of these things automatically. The average user, I'm sure, simply wants to enter notes and have the program do the rest. The other reason for using a scorewriter is to produce quality output – Music Publisher was designed with both these points very firmly in mind.

The content

The package includes a rom and a disc. In usual Hybrid fashion, the disc is used to generate a Start-up work disc which contains operational files. You can create as many Start-up discs as you like and store scores on these or your own blank discs.

On booting, you are presented with a main menu from which you can load and save scores, edit, preview and print them and set up the program for 9 or 24-pin printers. These alter the pixels per inch and image width settings according to the printer but you can alter them directly if you wish. The program also works with Epson-compatible laser printers although there are no separate settings for these.

Music Publisher uses a system of codes for creating the score. These are entered in the lower half of the screen while the bar the cursor is on can be displayed in the upper half. You can scroll through the score using the cursor keys, insert characters simply by typing them and delete characters with the delete key.

The basic codes are fairly easy to get to grips with – t and b are used for treble and bass clefs, note names are in upper case with a +, - or = sign in front to represent a sharp, flat or natural sign. Numbers are used for octaves and there are *octave up* and *octave down* shortcut symbols.

Durations are represented by the

initial letter of the note duration – w (whole note) for a semibreve, m for a minim, c for a crotchet, q for a quaver, s for a semi-quaver, d for a demi-semi-quaver and h for a hemi-demi-semi-quaver. You can extend the duration of a note in normal notation fashion by putting one or two dots after it.

Easy chords

Chords are constructed by connecting the note names with ampersands – C&E&G produces the chord of C major, for example. The semi-colon is used to insert a comment into the score like a REM statement.

Here's what the first few lines of one of the example scores look like:

```
(t1)    ; stave - treble clef and 1
part
(c.=90) ; metronome marking - dotted
crotchet = 90bpm
(+1)    ; key signature   1 sharp
(6/8)   ; time signature
[1c5D qD D4B5E ]
[2c5D qC c4B. ]
```

Scores are entered a bar at a time encased between square brackets [ ] and you can display any bar in the top half of the screen by placing the cursor on it and pressing Tab. If you have made a syntax error the program will not be able to display the bar but reports the error so you can correct it.

A Model B can store approximately 3,500 notes which will average around 10 pages of three-stave music. A BBC Master can store more.

Pulling out the stops

The program can create scores with up to six parts and the disc contains several templates containing different stave layouts which are a useful starting point. With the more complex scores, there are additional codes to remember and you will need to keep the manual handy if you are entering scores of any complexity.

Music Publisher supports alto and tenor clefs and a good range of music symbols including repeat ending bars – 1st and 2nd time bars and so on – percussion note heads, triplets, arpeggios, staccato, tenuto, trill and fermata markings, 8va and 15ma register changes and pedal markings.

It lacks a few symbols such as grace notes, dynamic markings (hairpins), phrase marks, some fancy bowing instructions and certain accents but the essentials are there. The rom is too full to allow many additions!

Although Music Publisher formats the score according to music rules, you can override certain functions. For example, you can flip note stems, beam notes and split beamed notes. It also supports anacrusis or pick-ups, initial bars which don't contain their full complement of notes. Errors in the sum of the durations of the notes in a bar are flagged by putting a + or - opposite the parts in the top part of the screen.

Advanced editing

The scores are stored in standard Ascii format which means that once you've mastered the codes you can create and edit scores in your favourite wordprocessor to take advantage of more-advanced editing facilities.

One very good aspect of the program is the ease with which a score can be edited. You must number the bars so you always know exactly where you are in edit mode as you scroll through the text of the score. You can see immediately what any bar actually looks like by hitting Tab.

Whereas edit mode can only show one bar at a time, preview mode shows the score as it will be printed, one screen at a time. As the screen is generally not capable of showing a full line, bars get split over two lines which can be a little disconcerting – although you can still see the overall layout. In multi-part scores, again because of the screen limitations, the parts are split over several screens. You can't flip back and forth through the preview which would have been particularly useful with multi-part scores.

What of the output? Well that's excellent, too. Producing a good-looking score is not as easy as you might think. The note and symbol shapes have to look right and be in the correct proportion. If the spacing is not right the score looks odd and it is difficult to read, especially by musicians who have been trained on the proportions of professionally-set music.

But no problems here with Music Publisher as it gets the proportions right. The only way you can trip it up is to enter very long lyrics in a bar in which case that bar will be considerably longer than the others. In such cases, a music setter might expand the other bars to restore a sense of proportion.

However, I can't imagine any other scorewriter handling this sort of problem any better and in any event, it's not the sort of thing you're likely to want to do – unless you're scoring Supercalifragilisticexpialidocious!

Printing is fast, too. You don't have to hang around while the program constructs laborious bit-mapped graphic images. There are two print modes – best and fastest. Best uses double-strike mode to give a denser image.

The program gives the impression of being well designed and it's nice to know new developments in music software are still taking place for the BBC Micro.

Following the documentation

The manual is excellent. The Getting Started section takes you through the setting up process and explains how to load, edit, preview and print a score. The next section takes you step by step through the process of entering a simple music line and the next chapter looks at a more complex three-part score with lyrics. By the time you've worked through those examples, you'll be familiar with most of the functions of the program.

The next chapter explains the menu functions in detail and then there is a full description of the codes used by the program. The final chapter explains how to fit the rom and covers the models B, B+ and Master plus rom cartridges. The manual, amazingly, contains not one index but two – one of subjects, the other of codes.

> *“Although Music Publisher formats the score according to music rules, you can override certain functions. For example, you can flip note stems, beam notes and split beamed notes.”*

Summing up

There is an inevitable learning curve associated with any program which uses codes and keystrokes to create its output and Music Publisher in no exception. However, the codes chosen are probably as memorable as they probably can be and after some use familiarity does creep in. A big advantage of its text-based entry system is the ability to edit a score very easily.

The aim of the program is to produce quality music printouts and in this it excels. It removes the need to think about beaming, stem direction and spacing which is a major problem in scorewriters and you can override all of these settings if you wish.

In fact you can specify the beat length to which notes are beamed. However, in most cases you will be able to enter the notes and let the program take care of the formatting.

The layout is excellent and well-proportioned and apart from the blocked nature of the printout due solely to using a dot matrix printer, it would be difficult to tell the difference between this and a piece of sheet music.

All in all the best score printing program yet for the BBC Micro.

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EDUCATION Update

Speaking in tongues

A CONSORTIUM of European colleges and companies has won a major contract to develop a new generation of interactive materials for learning foreign languages based on the A5000 and A540. The project is codenamed Eloquent and is subsidised by the European Community's Lingua programme.

The initial work will be based at the Thomas Telford School in Shropshire. This City Technology Centre will be developing new materials to work across a custom-designed multimedia computer network.

The aim is to enable students to learn languages with a vocational slant while interacting with moving pictures, sound, graphics and text from a computer. In the long-term this multimedia approach is expected to replace the present-day sound-only cassette methods of language learning.

Acorn will be providing the technical support and the machines in the project will be accompanied by CD-Roms, the Acorn Replay system and sound sampling to capture the individual student's progress.

Stephen Hagan of the CTC Trust is Eloquent's director and commented: "This project harnesses new ideas and new technology to speed up this process and make language learning an easier and more exciting proposition than it used to be."

4Mation Kiwi award

AT the 1992 New Zealand Computer Software Awards, 4Mation's New Zealand arm won the Export Award for Poster written by Paul LeBeau and David Caughley for the Archimedes. The Bits and Bytes-sponsored Awards are an annual recognition of the software designed and produced in New Zealand.

More and more UK companies are using New Zealand design teams but this is the first time that software for an Acorn machine has won this award.

Indeed in making the award, Bits and Bytes commented on the improving standard of New Zealand software and the increasing range of entrants this year in the educational software section.

DTP extras

NOT satisfied with the Gold prize, Educational Technology Award in January for Desktop Folio, ESM (0223 65445) have brought out a new and improved version.

As well as being friendlier to use it can be run easily on a 1Mb machine. There is more choice too when it comes to presentation and printing with automatic saving and Concept Keyboard support.

ESM also have a range of Curriculum Theme packs aiming to take the heartache out of inventing your own page designs for topic work. Each contains graphics – which can be used with any Archimedes program – as well as illustrated practical ideas in a booklet and ready-made page layouts.

Recent additions to the range are the Space and World War II theme packs priced at £29.50 each. The former allows pupils to design factsheets to support study of physical processes – such as the changing moon phases.

The ready-made templates such as the one for keeping a logbook of a space journey are designed to stimulate, and the time charts aim to foster a deeper understanding of time and chronology.

The World War II pack is equally inventive with pupils encouraged to create their own clothing coupons, ration cards and evacuee cards to give a real feel for the period. If they prefer they can make their own adverts, newspapers and posters in an attempt to explore communications media of the time. A special cursive font adds an authentic feel to a letter from an imaginary soldier or evacuee.

Special date

Northwest SEMERC's Micros for Special Needs Exhibition

ANYONE interested in special needs should make a note in their diary for October 13-15. These are the dates of the Micros for Special Needs Exhibition to be held at The Queen Elizabeth Hall in Oldham.

The event is organised by NWSemerc (061-627 4469) and is the fifth of these exhibitions. The National Council for Educational Technology (NCET) will be hosting a series of stimulating special needs seminars in parallel with the exhibition and special children from seven local authorities will be showing visitors how they use computers.

Primary concept

THE Primary Pack from The Concept Keyboard Company (0962 843322) have produced a pack aimed at BBC Micro users.

The package consists of a Concept Keyboard and Concept Kids software.

Its aim is to help teachers and pupils to get to grips with the keyboard in an entertaining way while covering areas of the National Curriculum.

As well as the discs and overlays – in A4 and A3 sizes – a flow chart for teachers shows how to use the software in various points of the curriculum.

Concept Kids is three separate but related programs for all primary ages and written by Sherston Software. First is an adventure called Concept Kate which poses some interesting problems.

This is followed by Concept Ken's Cartoon which is an open-ended cartoon picture processor. To introduce science Concept Kate's Challenge involves experimenting that results in landing a rocket.

Tout le monde

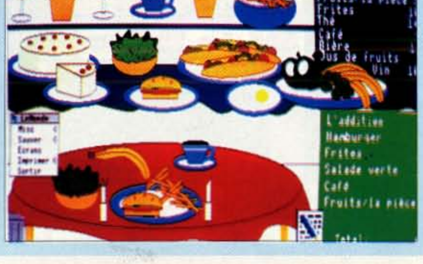
MULTILINGUAL education packages are increasingly common, but Le Monde à Moi is a new package from NWSemerc (061-627 4469) for nine year olds. It aims to stimulate spoken and written French as well as provide teachers with a flexible demonstration tool.

Le Monde is available for the Archimedes for £15 and is based on the popular My World system. A wide range of illustrated scenes for everyday life is included and using the mouse, pictures and text can be sorted and matched. Objects can be picked up and placed elsewhere, copied, labelled and sentences constructed.

One of the scenes is based in a café designed to stimulate language activities and role playing. Children listen to a tape, follow a worksheet or create their own conversation, selecting food and drink from the café shelves.

An order can be taken from the menu and placed on the bill. The overall emphasis is on comprehension and oral language rather that the written word.

Text use is very flexible letting you create additional words or phrases, and unwanted objects and words can always be put in the dustbin. The User Guide encourages teachers to develop their own screens too.



You should CoCo

Rog Frost looks at a new control on the Archimedes

Product: CoCo
Price: £49.95
Supplier: Commotion, Rodburn House, Stockingswater Lane, Enfield EN3 7TD.
Tel: 081-804 1378
Requirements: Risc OS

MEASUREMENT and Control using the Archimedes seems to be becoming a speciality of mine these days. Until recently, I was a confirmed 8-bit computer user for these tasks. The new range of friendly software for the 32 bit computers has changed that.

Commotion's new software pack, CoCo, enables you to write simple and effective programs to sense real events in the outside world and switch on electrical devices as a result of those events.

To put it in a nutshell, users of CoCo can get information into the computer in ways beyond the normal keyboard or mouse and can send data out to places other than the screen or a printer.

First a health warning: CoCo is a piece of software. It won't switch bulbs or motors on or off unless you've got bulbs and motors. It won't tell you if it is hot or if it is raining unless you've got temperature or rain sensors, and of course, it won't provide you with sockets to plug all this gear into. Neither will it provide buffering circuits to ensure that you don't damage your computer.

What you will need is a buffer or interface box. A number are available and not surprisingly Commotion produce their own. This is ideal for the home expert but it does let you connect wires up wrongly.

My own favourite is the *Control It* interface from Deltronics. This works perfectly with CoCo and is tailor-made for school use, with different connectors for inputs and outputs. Commotion tell me that CoCo will work with most eight input and output buffer boxes and there is a separate version for the Lego A interface.

I'm afraid enthusiastic experimenters will need more. The 32-bit computers are not well equipped with inputs and outputs and you will need to fit a user port podule as well as a printer port. You'll probably want an analogue to digital port as well. If you are going to find it inconvenient to disconnect your printer for control work you could use the UPexpand from Phobox. This provides, effectively, a second printer port.

It sounds an awfully complicated business but in fact it is harder to write about than set up. So who will want to use this?

There are always home experimenters keen to make their computer control the washing machine or the central heating boiler. But the big group who'll be interested in this area of work are schools, because the National Curriculum makes it the law to teach computer control.

Hopefully, schools will also be interested because control provides opportunities for pupils to explore and solve real problems and have fun at the same time.

Control is not just limited to secondary schools and their Design and Technology areas. Primary students, too, can benefit from this area of the curriculum where computer programming, electric circuits and mechanisms all tend to meet up.

Lego, or glue guns and second use materials can provide the mechanisms. The control box with sensors and output devices provide the electric circuits. Now let's look at what CoCo can do.

CoCo provides users with a simple programming language for control. Those familiar with Control Logo will have no difficulty in recognising commands and its available in either English or Welsh.

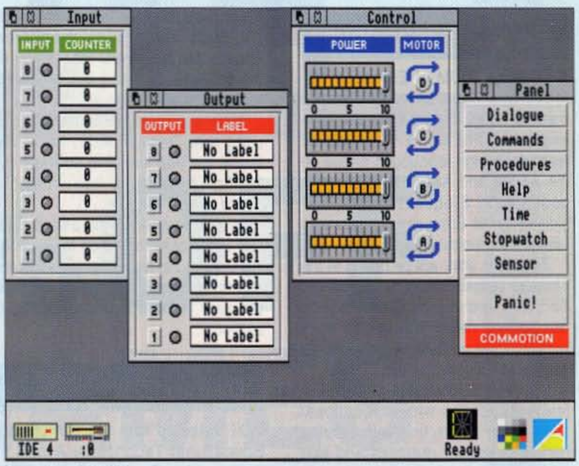
The software allows for up to eight outputs. These could drive devices such as light bulbs, motors, buzzers or relays. Each output has a number – 1 to 8. The device connected to output 1 can be switched on by typing SWITCH ON 1 and switched off again by typing SWITCH OFF 1.

Outputs can be paired to provide forward and reverse control for motors. The four pairs are labelled A-D. Commands such as MOTOR D ON, MOTOR D REVERSE and MOTOR D OFF are possible. Motor speed or bulb brightness can be altered using the POWER command.

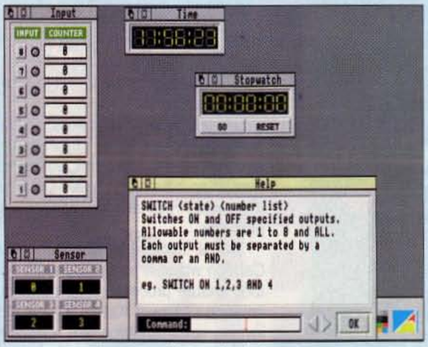
Input devices such as switches, light sensors, pressure mats, tilt switches and the like, can be connected to inputs on the buffer box. Commands such as IF INPUT 1 ON THEN SWITCH ON 2 enable the computer to make a response to a particular condition. The trouble, at first sight, is that you keep having to type the command to check if input 1 actually is on.

The solution is to make use of a loop command such as REPEAT FOREVER. If things go wrong, you can always hit the Escape key or select Panic!

The Logo structure of CoCo becomes clear when you start to define your own words for the computer to understand. For example, you might BUILD FLASH. You would now use the commands



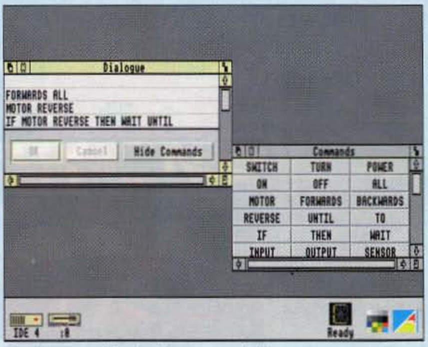
Easy to use interface



```
SWITCH <state> <number list>
Switches ON and OFF specified outputs.
Allowable numbers are 1 to 8 and ALL.
Each output must be separated by a
comma or an AND.

eg. SWITCH ON 1,2,3 AND 4
```

A very comprehensive and interactive help system



```
FORWARDS ALL
MOTOR REVERSE
IF MOTOR REVERSE THEN WAIT UNTIL
```

Good command input options are available already known by the computer SWITCH ON, WAIT, SWITCH OFF to make one or all outputs switch on and off.

This new word can then be used in the same way as any other. It can be used to BUILD new commands. The next possibility might be to make bulbs flash and buzzers beep if someone trod on a pressure mat. New commands can be Saved to disc and Loaded back in for re-use on later occasions.

If you have access to an Analogue port, control can be based on the level of a sensor. Perhaps you could turn a fan on if the temperature reached 20 degrees. The possibilities are endless.

So what makes CoCo particularly good? First must come the ease of entry of commands. You can type them in from the keyboard. Alternatively you can enter most common ones at a stroke with a function key or they can all be selected from a menu using the mouse. In other words, there is no problem with spelling. If you choose to type at the keyboard, CoCo won't worry if your commands are in upper or lower case.

Secondly, the display is first rate. On screen is a clear representation of what the control box is doing. Other windows open as required and can be managed in the standard Archimedes way. It makes the program so simple that you barely need a manual at all.

Thirdly, there are extras. All inputs have a counter so that the computer can know how often they've been on. This combines with a good real-time display and a full-feature centi-second stopwatch to provide a wealth of control options. It is possible to write messages on the screen and with Superior Software's Speech, CoCo can talk as well.

Finally, should the slim and easy-to-use manual become too much of a problem, the whole package can be explained on-screen by selecting the Help option.

Summing up

CoCo provides schools with a fine tool for the implementation of this part of the National Curriculum. It is easy to use and provides immediate reward for the youngest of pupils. It has the ability to stretch the imagination and skills of bright 16 year olds and, no doubt, those even older. It is a near essential purchase for all schools and will also offer a lot of fun to the home control buff and experimenter.

Sunny interval

Can you turn your children into budding Michael Fish clones? Marshal Anderson investigates

Product: Weatherman
Price: £19.95
Supplier: HS Software, 56 Hendrefoilan Avenue, Sketty, Swansea SA2 7NB.
Tel: 0792 204519
Requirements: Risc OS

OVER the past 10 years or so we have seen educational software for primary schools go through several stages of development. Packages have become broader in their subject base, many freeing themselves completely from any notion of content.

With the introduction of the National Curriculum we might have expected the broadly based *topic* program to have withered on the vine. But not so, Sherston's Viewpoints and CSH's Frontier 2000 show that this kind of package still has a large role to play in the use of computers in schools.

At the same time we have seen the the running down of drill and practice programs, a conscious move directed largely by the IT decision makers in education. This is not necessarily a bad thing – there was a lot of rubbish about in the early days but it is a shame to see the demise of the straightforward, single skill program from the catalogues and development plans of most software publishers.

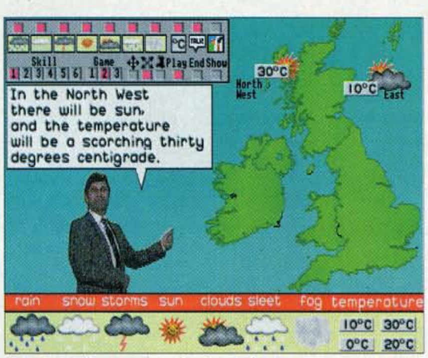
The National Curriculum actually lends itself to this approach with its huge number of specifically described skills and knowledge targets. Recognising this HS Software have continued to produce such packages and the latest is perhaps the most specific yet, dealing very simply with a very particular area.

Weatherman tackles a few specific Attainment Targets in the areas of science and geography. You are presented with a weather map and its accompanying weatherman.

Along the base of the screen is a variety of weather symbols which can also include a simple temperature range. The weatherman speaks in the required regional accent – why do they all talk like that? – to say, for instance, that "In the North there will be clouds".

Click on the required symbol – some are animated – and drag it to the North of the map. If you have selected the temperature option you also have to click on the required temperature and drag that on to the required part of the country. And that's it.

So, what are you actually getting here? First you're looking at points of the compass and how they relate to a map of the UK. You can select North, South, East and West or Northeast, Southwest and so on. Beyond that you can use the country names of Scotland, England, Northern Ireland and Wales. From the geographical point of view, then, you are reinforcing the basic divisions in the map of the UK and learning about compass points.



In the North West
there will be sun.
and the temperature
will be a scorching thirty
degrees centigrade.

Game two allows you to order the weather

The actual weather types available are rain, snow, storms, sun, clouds, sleet and fog and you decide whether you want just one or any combination of these. This lets you cue into the work about weather in the National Curriculum science document and the addition of the temperature option adds a little maths.

The actual game can work on several different difficulty levels. At the lowest level there's as much time as you need and a certain amount of help with placing the symbols on the map. In fact at this level it really is placed for you. A record is kept of the mistakes you make and at the top level very few are allowed.

The three variants allow you to place the symbols as they are spoken, make up your own weather forecast or enter the names of the type of weather being presented. There is also the facility to save the weather map as a sprite at any time and for use in other packages.

None of this is particularly earth-shattering and it's certainly not a teaching program. Nor does it claim to be. It is the sort of thing that could be used very well in the junior classroom as part of any project on the weather, as an introductory or reinforcing task.

The graphics are good and the voice sampling is very well done. The whole thing is nice and intuitive – there's no need to tell the children what to do if they have any experience with the mouse at all.

Using this as reinforcement you would probably get a class of eight year olds through it in a day working in small groups, no matter which game level you choose. That is all you would need or want to do with Weatherman. It's nice to see such specifically targeted software still being produced and it's a shame that HS didn't include an exact listing of the Attainment Targets covered. This would save teachers a lot of time.

Summing up

If you are doing a topic on weather in any primary classroom this is a great little program to have and it's priced very sensibly for school. From the point of view of the home market, cheap though it is, it is likely to be of very little interest as its playability soon falls off for any individual child.

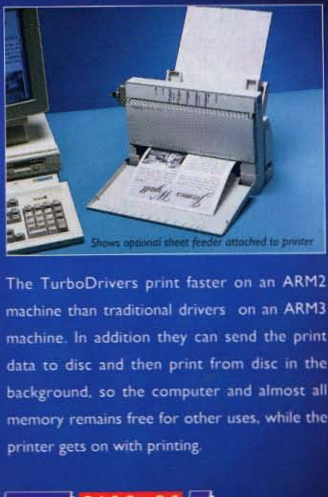
THE DRIVING FORCE

MicroScope
The news weekly for the microcomputer industry
Metrologie takes a full stake in Trinitec
BJ-10ex

Winner of the Best Printer in the recent Computer Shopper Awards, the Cannon BJ10ex printer has revolutionised the small printer market. It offers 360 dpi, near laser printer quality, on plain A4 paper, in an incredibly compact and lightweight housing. Unfortunately the existing RISC OS printer drivers, based on the standard Acorn drivers, have definitely been in the slow lane, locking your computer up for the entire print process, often up to ten minutes per page.

Computer Concepts have now created a set of RISCOS printer drivers, called TurboDrivers, that are optimised for the Cannon BJ10ex printer. The result is the perfect combination of budget printer and RISCOS printer driver, able to print full 360 dpi high resolution pages at a quality superior to that available from any dot matrix printer.

The TurboDrivers not only print the pages faster, but give control back sooner - up to ten times quicker. The table shows the time taken to print and the time the computer is occupied for some typical example pages.


Shows optional sheet feeder attached to printer

The TurboDrivers print faster on an ARM2 machine than traditional drivers on an ARM3 machine. In addition they can send the print data to disc and then print from disc in the background, so the computer and almost all memory remains free for other uses, while the printer gets on with printing.

	Standard Driver	**TurboDriver**	
	Time to complete	Time to complete	Time to get control back
A complex page of text & graphics	521 seconds	199 seconds	70 seconds
2 pages text in different fonts	753 seconds	283 seconds	64 seconds
One complex page from !Draw	643 seconds	261 seconds	187 seconds

All times in seconds from a standard ARM2 Archimedes with 4MBytes RAM and hard disc. Times would be faster for an ARM3 based machine.

BJ10ex printer & drivers £249.00 + VAT (£292.57) + p&p. Optional 30 sheet feeder £48.00 + VAT (£56.40)
TurboDriver software & printer cable £49.00 + VAT (£57.57)

Compatible with all applications that use the RISC OS printer drivers and all Archimedes models.

RISC OS
Turbo
DRIVERS

Computer Concepts Ltd

Gaddesden Place Hemel Hempstead Herts HP2 6EX 0442 63933

Product: Junior PinPoint
Price: £24
Supplier: Longman Logotron, 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS.
Tel: 0223 425558
Requirements: Risc OS

Get to the point

Frank Jukes examines the benefits of a cut-down version of PinPoint

LONGMAN Logotron really have got a winner with Pinpoint and now the cut-down version, Junior Pinpoint. While I felt that primary schools would be happy with Pinpoint I am certain that they will be delighted with Junior.

The philosophy which underpins Junior Pinpoint is, of course, the same as that of the full featured version which I reviewed in the January issue of *The Micro User*. In essence, the technicalities and the language of database construction and manipulation are removed from the eyes and hands of the user. This frees them to concentrate fully on collecting and handling the data.

Junior Pinpoint goes one stage further as progress through setting up the database, entering the data, analysing it and reporting on it is more linear. So there are fewer opportunities to lose your bearings.

Much of Pinpoint is present in Junior Pinpoint and I think most primary schools will be happy with the features Longman Logotron have included.

They have removed mainly those items which deal with the more complicated aspects of manipulating and displaying data – like the ability to have more than one set of data present at the same time. These options would not be of any use in the vast majority of primary classes.

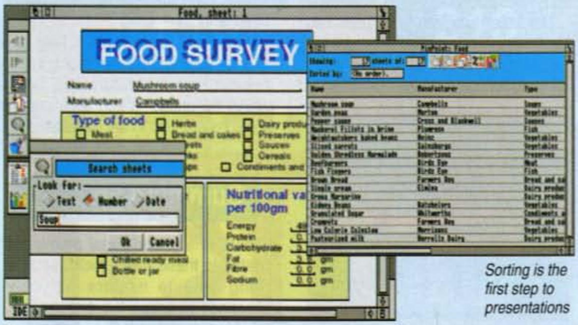
Like its big brother, it works through questions such as *How tall are you?*, rather than expecting an entry against something like *Height* which is rather terse and unhelpful.

Using the mouse to create the survey sheet of questions is simplicity itself. Just drag out an area to take your question, type into a dialogue box, click within the box to give details of the type of answer the question is designed to elicit, click on any other relevant parameters and the basic framework is complete.

At this stage the database is ready to receive data. Alternatively, data collection sheets may be printed and filled in for the information to be entered at a later date.

My only reservations about this part of the program are concerned with the search tool and with the icons used in the toolboxes. The search tool is used to search through sheets to look at or change information and it doesn't always work. It appears to be very choosy about what exactly it will match. In one particular instance it would find *eg* or *egga* but not *egg*. Strange.

The toolboxes are on-screen menus placed down the side of the windows in a similar way to those in Draw. The problem is that the icons contained within them do not convey their meaning very clearly. However, the manual does give a good explanation.

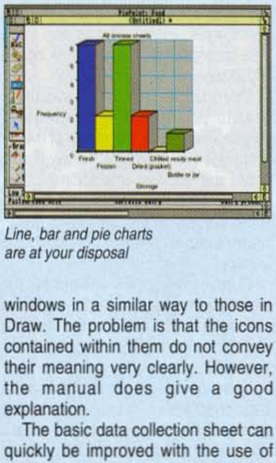


Name Mushroom soup
Manufacturer Campbells

Look For: Soup

Straightforward searching

Sorting is the first step to presentations



Line, bar and pie charts are at your disposal

The basic data collection sheet can quickly be improved with the use of outline fonts, colour, drawfiles and sprites.

If you are going to collect data on favourite foods why not have a picture of a burger in all its gory glory sitting there right next to the question *Do you think you eat a healthy diet?*

Once the data has been entered it can be worked on in the spreadsheet-like analysis section. The searches and sorts are powerful, fast and easy to use and setting them up is achieved by clicking in dialogue boxes which are models of clarity.

As in Pinpoint if field data isn't required it can be temporarily removed from the display by dragging the relevant heading off the top of the matrix. The order in which the fields are displayed may also be altered, again by dragging.

Once the appropriate searches and sorts are complete, lists can be easily produced and printed. Impressive reports using graphs and text can be prepared and bar, pie, line or scatter graphs are also available – the first three with a 3D option.

Although not all Pinpoint's display options are present in this version, colour, outline fonts, draw files and sprites may be used to enhance reports and help to create work in which the children can take real pride.

A useful addition, not mentioned in the manual, is the configuration option available via the icon bar menu. A whole range of options may be selected or deselected and the program made as simple as the teacher would like. Unlike many programs which grey out unavailable options, Junior Pinpoint actually removes them from the screen thus reducing any clutter or confusion.

The only feature I would ask to be returned to the program is the route back to the sheet construction and completion sections from the analysis section. The only way to return in the present version is by quitting and then restarting.

The manual is very different from that of Pinpoint as it is non-technical and written for children. Although patronising in tone at times, it is easy to use and follow. Designed to be read as a text book or dipped into for reference, the pages are nicely paced and get their message across well. Using cartoons, screen shots and text, they are ideal for photocopying and pinning next to the computer.

Summing up

One of the important things to remember about a program like Junior Pinpoint is that children and teachers have to learn to use a whole variety of different techniques.

With this in mind a good program should hide its complexity and the new user should find it quick and easy to learn. It should have a strongly intuitive feel to it and the need for reference to the manual should only be very occasional. It should also be capable of producing results of the very highest quality without excessive technical knowledge or expertise.

Junior Pinpoint meets these criteria. It is not perfect but I have yet to find a data handling package more suitable for use in the primary school.

Product: SmArt Packs: Aliens, LookSmArt, SmArtoons, Modern Languages Pack, French and German versions of Faces, Leisure and Homes packs
Price: £16 each though the Modern Languages double pack is £20
Supplier: 4Mation, 14 Castle Park Road, Barnstaple, Devon EX32 8PA.
Tel: 0271 25353
Requirements: Risc OS

That smarts!

Steve Bruntlett evaluates some smArt add-ons

FOLLOWING hard on the heels of the first batch of smArt packs come two more for use with the Linked Graphics System used by 4Mation for its smArt system.

SmArt, as you may remember, allows you to produce a wide range of variations on particular drawn images by changing one or more of the elements.

For example on the front view of a head from the original, French or German versions of the Faces pack you can change all the features of the face, including the skin colour, to produce a phenomenal number of different heads without any mismatch of the elements of the resulting image. See the January 1992 issue of *The Micro User* for the original review.

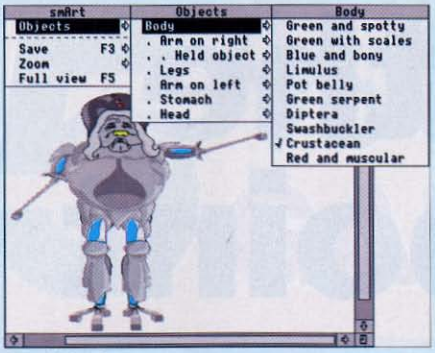
First in the new range is **Aliens** which has four components: Aliens, Backdrops, Ideas and Profiles. The first of these shows a full frontal alien, which is not a pretty sight, especially as the first one you see has an upright green and spotty body, a bird head with hands on hips and is wearing a cap.

If you're not particularly struck by this alien you can have one with a blue and bony body, green with scales, pot-bellied, red and muscular and so on.

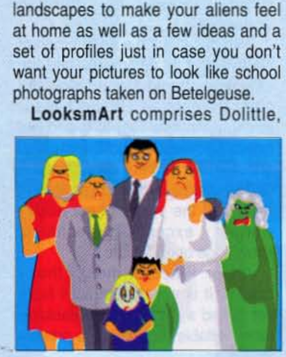
The head, arms and hands can also be changed showing you some of the options available. Gruesome isn't it?

It also includes a variety of landscapes to make your aliens feel at home as well as a few ideas and a set of profiles just in case you don't want your pictures to look like school photographs taken on Betelgeuse.

LooksmArt comprises Dolittle, Ideas, Unwanted, Talk and Sentiment. Dolittle provides you with an enormous range of variations to produce single or multiple images. You can change the head, mouth, teeth, eyes, eyelids, snout and ears. The backgrounds give you the option of full face or full character.



A new lifeform?



Making the right expression

The idea of this pack is to allow you to produce a wide range of expressions using the range of mouth positions provided. So, for example, there are expressions such as ah!, teeth bared, ee!, er, ergh!, glum, glummer, Oaargh!, oi!, ooh!, orgh!, slurp, simper, snarl, ugh!, yuk! and yukyuk!

Combined with six options for the head, seven for the teeth, eight for the eyes and eight for the eyelids quite a range of expressions can be explored.

The Ideas section of LooksmArt demonstrates some of the possibilities of using the drawn images in constructive and creative ways in an educational or home setting. These are essentially sheets of text and images based on the four smArt files.

There are 10 for Unwanted, five for Sentiment, three for Talk and three for Dolittle.

Sentiment is a file containing a number of scenes including a single face, a wedding, a choir and an underwater scene. On to these can be mapped 30 different expressions in four colours to change either a single face or the faces of the people in the group.

Opening Talk you'll find the basics for producing talking heads though none of them looks a bit like David Byrne. I suppose this file is similar to Dolittle except that it's human – at least some of its variations are.

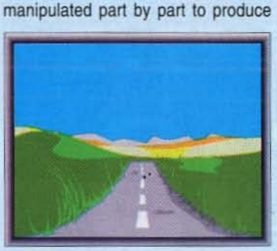
There is a range of 29 sounds and expressions with a full face, a filmstar, three ghosts, a jailbird and a TV personality. The full face has eight different persona available in all versions but in the filmstar mode there are also 10 different audience scenarios.

The last file, Unwanted, is based on a combined front and side head and shoulders shot with various height charts, four faces, three ears, six noses, five eyes in seven colours, three eyebrows, seven mouths, nine lots of glasses, three beards, four moustaches and six different hairstyles. I don't know how many different combinations that must be but it certainly gives you scope for a few wanted posters.

The third smArt file pack, **smArtoons** contains 15 different cartoon characters all with many sections of options. These are Ape, Bird, Bunny, Cyclist, Dog, Jumbo, Pig, Tortoise and Vulture.

There are also Backdrop and Highway files for scenery. In addition the Highway file has two sky options, eight types of scenery and 16 different roads with the Backdrop having only two skies but 41 backgrounds, six midgrounds and seven foregrounds.

The other two files are Poser and Skeleton. Poser is an electronic mannequin whose body can be manipulated part by part to produce any kind of position and orientation. I suppose it's a full bodied version of the talking head but without the speech. Finally, Skeleton contains 17 individual or sets of bones which can be moved independently between two and seven different positions.



I'll take the high road

There is great potential for animation with these files and in combination with Iota's Animator, reviewed in the June issue, which has the ability to grab frames from an area of the screen with just a key press, moving pictures become very easy to develop.

4Mation have also produced a Modern Languages pack which consists of two sets of files on two discs with an A5 instruction book showing what's available and how it might be used in Modern Languages. One set illustrates a meal at a table with menu items in the chosen language.

These can be labelled in any language using Labels. With MultiLang the meal menu is in English but the items can be labelled in different languages.

The second set shows a collection of items on a shelf. The languages used in the files are French, German, Dutch, Portuguese, Spanish, Turkish, Italian, Greek and Hebrew.

HebrewFont and TurkFont system fonts are provided allowing the menu items to be displayed correctly. Greek and German Characters can also be used.

The SystemFnt file restores text to English and a Keyboards smArt file shows German, Hebrew and Greek keyboards.

The final set of smArt files are French and German versions of the original Homes, Leisure and Faces smArt file packs. Welsh and Spanish versions are also in the pipeline.

Summing up

There is a phenomenal amount of detail in these files which needs a long time to explore but only seconds to begin the exploration. Highly recommended!

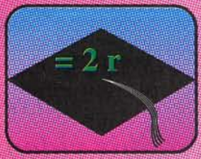
BBC OCTOBER 16-18

ACORN USER The 1992 SHOW

WEMBLEY EXHIBITION CENTRE
October 16th to 18th 1992

Opening Times :-

Friday 16th October - 10.00 am to 6.00 pm
Saturday 17th October - 10.00 am to 6.00 pm
Sunday 18th October - 10.00 am to 5.00 pm



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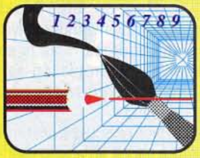

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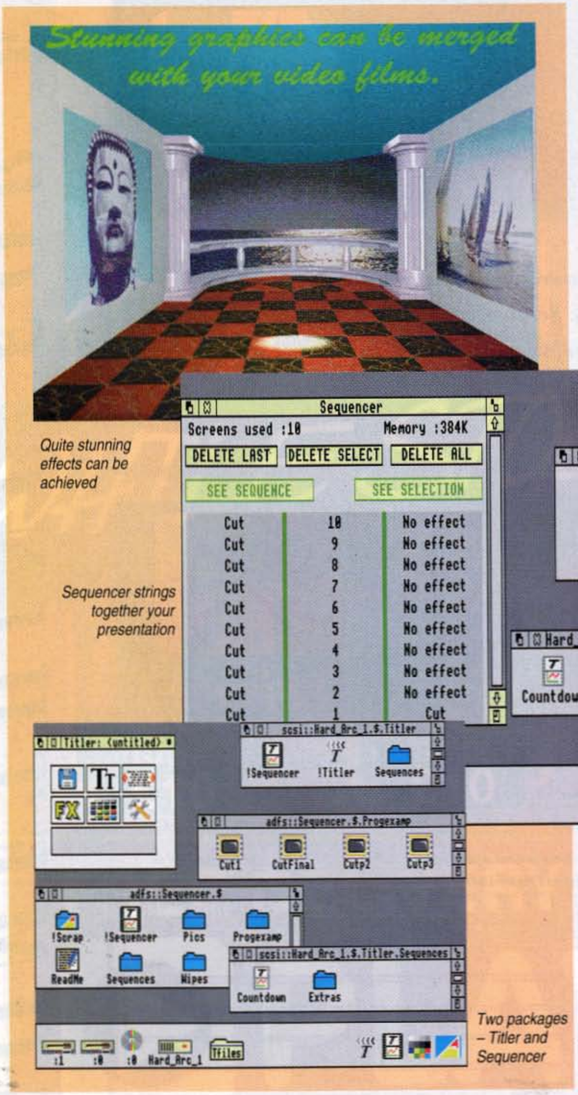
S O M E T H I N G   F O R   E V E R Y O N E

Captivating captions

Mike Cook mixes it with his video


Stunning graphics can be merged with your video films.
Sequencer
Screens used :10
Memory :384K
DELETE LAST
DELETE SELECT
DELETE ALL
SEE SEQUENCE
SEE SELECTION
::Sequencer.$.Proge
Cut1
CutFinal
Cutp2
Cutp3
Hard_Arc_1.$.Titler.Seq
Countdown
Extras
Titler: (untitled)
scsi::Hard_Arc_1.$.Titler
!Sequencer
!Titler
Sequences
adfs::Sequencer.$.Progexamp
adfs::Sequencer.$
!Scrap
Pics
Progexamp
ReadMe
Wipes
scsi::Hard_Arc_1.$.Titler.Sequences
:1
:0
Hard_Arc_1
!Files

Cut	10	No effect
Cut	9	No effect
Cut	8	No effect
Cut	7	No effect
Cut	6	No effect
Cut	5	No effect
Cut	4	No effect
Cut	3	No effect
Cut	2	No effect
Cut	1	Cut

Quite stunning effects can be achieved

Sequencer strings together your presentation

Two packages – Titler and Sequencer

Product: Titler
Price: £149.95
Supplier: Clares, 98 Middlewich Road, Rudheath, Northwich, Cheshire CW9 7DA.
Tel: 0606 48511
Requirements: Risc OS, more than 1Mb preferable.

ONE of the main benefits of computers is their ability to manipulate text and graphics and a window environment makes using the machine so much easier.

However, there will be occasions where you do not want to see the Wimp, for instance, when making a presentation, and this is where Titler comes in.

In fact you get two packages: Titler allows you to create interesting screens and Sequencer lets you play them – and others – back.

The package was originally designed in New Zealand for producing TV titles. However, it is also invaluable in producing sequences of screens for presentations, displays or open days.

The unique feature of this package is that it integrates a full screen display with the working environment of the Desktop which means it takes longer to become familiar with than most programs.

The main operation window shows six boxes with icons and a long grey box. The idea is you select the option you want, click the long box and get the full screen and then work with that option.

This will mainly involve typing and positioning text – pressing the Menu button returns you to the Desktop. I found this constant to-ing and fro-ing with complete screen redraws slightly frustrating but I suppose I will get used to it in time.

Also on the Desktop was a registration window giving my name and address. This is some form of software protection as the window can't be closed – I found it very irritating.

Not only did it clutter the Desktop but it took an age to redraw whenever part of it was uncovered.

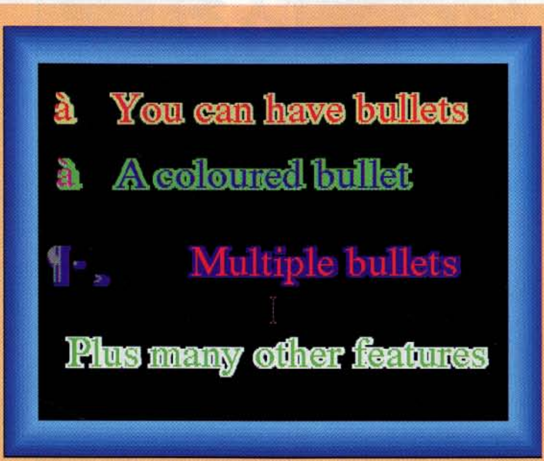
In fact I had to do a lot of juggling with buffer sizes and transfer the whole thing on to a hard disc before it was acceptable. As a remedy when working from floppies I placed a directory window so that it wholly covered the registration window to prevent the re-draws.

Clicking the icons with Select brings up a menu of related options but these can be reached as submenus if you click Menu anywhere in the window.

It is rather going against the guidelines to bring up a menu when Select is pressed and it is somewhat confusing at first.

Titler's tools are mainly concerned with creating text, yet images from other packages can be directly imported though not manipulated. The idea is that text is rendered as well as possible, and to that end it makes use of outline and anti-aliased fonts.

When working on the full screen the mouse controls the text position and so you have to use a barrage of Control or Shift key presses to manoeuvre the text insertion point and generally edit your text. Those



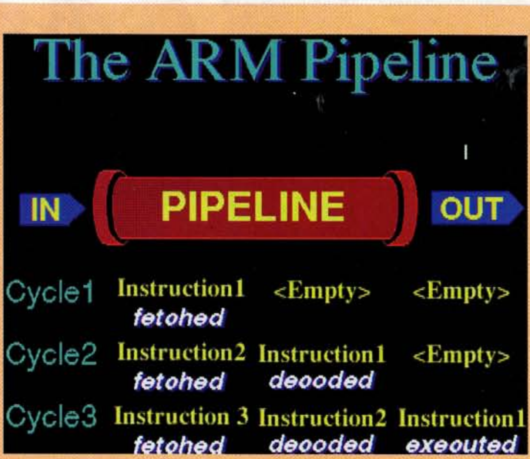
à You can have bullets

à A coloured bullet

¶-, Multiple bullets

Plus many other features

The styles and effects are up to you



The ARM Pipeline

IN PIPELINE OUT

Cycle1	Instruction1 fetohed	<Empty>	<Empty>
Cycle2	Instruction2 fetohed	Instruction1 deooded	<Empty>
Cycle3	Instruction 3 fetohed	Instruction2 deooded	Instruction1 exeouted

The finished articles can be as simple or complicated as you want

familiar with wordprocessors on the PC will be at home with this strange system.

Text can have a large number of effects applied to it like drop shadows, underlining and slow printing. All these options can be fine-tuned to get exactly the effect you want.

In practice, when I selected the drop shadow option I found the redrawing of a line of text slow as I positioned it with repeated flashing of the hourglass. This probably would not happen with the ARM3 chip.

Having created your screens Sequencer strings them together to form a presentation.

Not only Titler screens but those from other sources can be included: Humble sprites, ProArtisan creations, Render Bender pictures and animations, Ace films, Atelier compressed pictures and even Clear Pictures from the PCAT's graphic emulator all come together.

The whole is displayed as a long list created by simply dropping your picture icon on to the Sequencer. You can control how long each image is on the screen as well as how it makes its entrance and exit.

For example, it can roll in and fade out or any combination of the 23 options and variations – it can even choose its own random effect while running. There is also the option to have each screen accompanied with sound, either from a digitised sample or Tracker file.

You can look at all or just a section of your sequence – to ensure rapid editing and correction. Files can also be easily deleted.

Another way to create sequences is by writing a program. This is a text file created in !Edit which follows the built-in language syntax and gives access to all the effects.

This can be useful to pull in resources from different storage media as you don't end up with a fat sequencer file containing all the images.

If you are going to use this package to title your videos you will need a Genlock – a device that synchronises your computer to the video source. There is support within these packages for various Genlock options.

Alternatively some video editors and effects generators currently on the market allow you to mix unsynchronised video sources by re-sampling. If you just want to use this for displays the extra expense will not be needed.

You are here

Find your way with Titler

Penmon
Llanddona
Pentraeth
BEAUMARIS
LLANFAIRFECHAN
MENAI BRIDGE
BANGOR
Llandegai
Rachub
BETHESDA
Rhiwlas

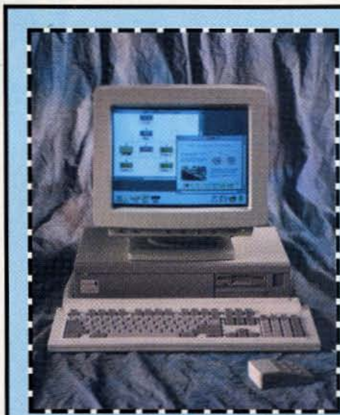
You can use files from many different sources

Summing up

Titler and Sequencer are excellent examples of how many different packages can be made to work together.

You can pull in your work from many sources and time is not spent learning another drawing package with perhaps limited features.

However, if I were designing the user interface I would have gone about it differently, as it is not the easiest of packages to master.



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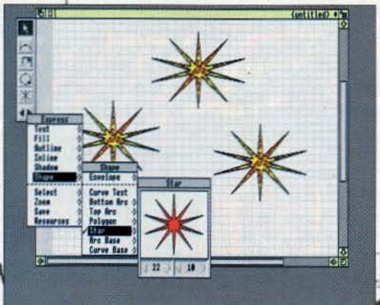
Graphics on the right lines

A new art package is put through its paces by Steve Turnbull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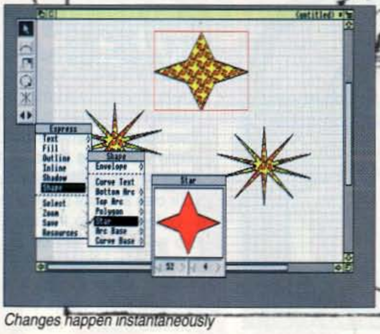
Envelope
Curve Text
Bottom Arc
Top Arc
Polygon
Star
Arc Base
Curve Base
Star
22
18

It's easy to create new copies of an object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Shape
Envelope
Curve Text
Bottom Arc
Top Arc
Polygon
Star
Arc Base
Curve Base
Star
52
4

Changes happen instantaneously

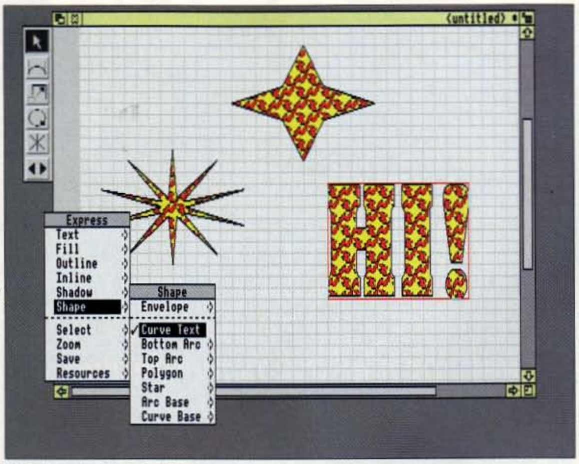
Product: Midnight Express
Price: £51.02
Supplier: Dabhand Computing Ltd.,
5 Victoria Lane, Whitefield,
Manchester M25 6AL.
Tel: 061 766 8423

GRAPHICS manipulation packages tend to be much of a muchness – usually having Draw as their starting point and adding features on top. But once in a while someone gets a brainwave and comes up with a unique concept – Midnight Express is the graphics package that makes new rules.

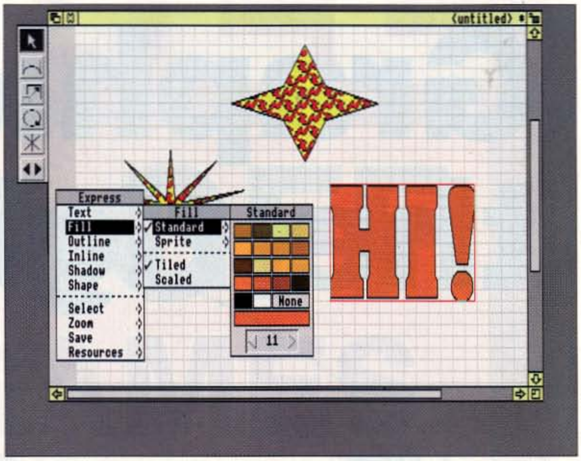
Does that sound like advertising hype? Well, *I'm* convinced, so let's see what all the fuss is about. Booting up the program the first time gives you a registration window – just type in your name and press Return.

An introduction window appears whenever you first run Express, and after a short while the icon appears on the iconbar. Clicking this brings up the editing window – Express does not handle more than one window at a time.

At the side of the window is the toolbox with six icons – select,



Objects can be changed to text...



...and fills modified on the fly

edit, scale, rotate, create and quick zoom. The last is really two icons set side by side – clicking one doubles the scale while the other halves it.

There are no drawing tools, because in Express you never actually draw anything, you simply manipulate prepared objects to achieve the effect you want. Clicking the Create tool and then clicking on the edit window puts up the default object, and the tool then switches to Select automatically.

The default object is the word TEXT filled in red with a black outline and placed in a rectangular box – there are no shadows. In fact every object in an Express document has all the attributes – outlines, inlines, shadows and so on – but they might not be switched on. They can be toggled on and off, but they are never lost.

So, for example, you could replace the text with a shape – filled in red with a black outline in a rectangular box – change the fill colour to green, then switch back to text and the same letters will appear but this time in the new fill colour. Some of the screenshots here show the kind of manipulation you can achieve.

Every object has to appear in an envelope which may be based on a rectangle or one of several other curve shapes. With the Edit tool you can modify the control points of the envelope shape.

With the rectangle you have the four corners which may be moved independently or linked with its opposite corner to move together or mirrorwise.

Plus, the two horizontal lines of the rectangle are actually curves and you can alter their control points to produce interesting curved text. These control points can be linked as well so that it's easier to produce symmetrical shapes.

The other envelope shapes also have control points but these vary depending on the shape itself. For example with arcs you can adjust the horizontal width and the depth. The linkages between the control points are modified depending on the type of envelope as well.

Where the text has been replaced by a shape the envelope is ignored and you can edit the control points of the shape itself – but the text and envelope are not forgotten. Whenever you switch back to text the envelope will reappear too.

Another attribute is Shadow and there are three types:

{*} Standard, which is a simple wall shadow

{*} Zoom which draws the background object in a given number of steps coming forward to the main object. This is effectively lots of layers one on top of the other.

{*} 3D which takes longer and gives the shape a solid look.

The position of the shadow is altered graphically and you can specify the colour of its furthest portion and the nearest – which can be different again to the colour of the actual object.

The final option on shadows is between filled and outlined – with outline only the outer edge of the shadow is drawn. This is not particularly exciting for standard and zoom shadows but with 3D it creates hollow objects, especially if the fill colour of the object being shadowed is also removed.

The Create icon produces an object that matches the current settings of all the attributes. Hence it is, in fact, a very fast copy tool. The iconbar icon has options to reset the attributes to their default settings.

Going back to the main object, you have considerable control over its fill colour as Express provides a huge number of preset 16-colour palettes to select from – 54 in all. On a Risc OS 2 machine you don't get a true impression of the colours, although a 256 colour mode works well enough. But with Risc OS 3 and the automatic dithering you can get real colour shades, even with the standard Desktop 16 colours.

The first palette is simply the Desktop colours while the next few give 16-interval graduations from a specific colour to white. Every palette has a black and white selection on it in addition to the 16 shades.

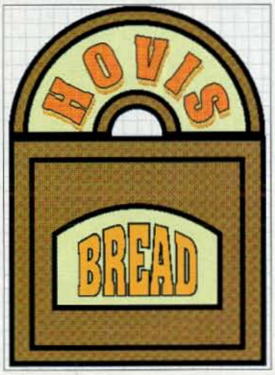
The later palettes contain various groupings of related colour but they're not continuous graduations. You can select a colour from any palette, you don't have to stick to just one.

In fact these colours approximate to the Pantone selection used in printing although they aren't matched to the proper Pantone numbers – an expensive licence would have been required. However this fact is useful in providing a guide to the colours for professional printing.

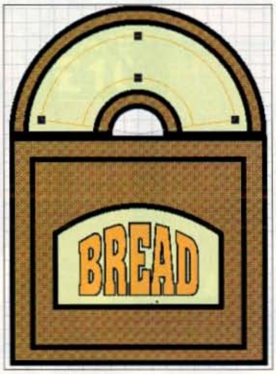
Apart from flat fill colours there is also the ability to fill with sprites. Again a huge selection is provided but you can add your own very easily just by dragging a sprite file on to the Express iconbar icon.

There are two modes of fill for sprites: Tiled and scaled. The former draws the sprite at actual size then repeats it vertically and horizontally. The latter stretches it to cover the whole area of the object its filling. For example, you could use a big sprite of your own and use it to fill a word.

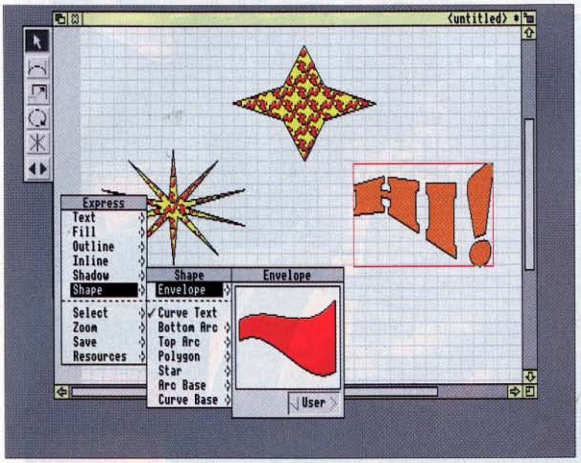
Going back to the icon tools, the two we haven't looked at are Scale and Rotate which work in a similar manner. When clicked, a target point appears at the centre of the currently selected object. If nothing's selected no point appears, and if more than



Build complete pictures...



...and edit the elements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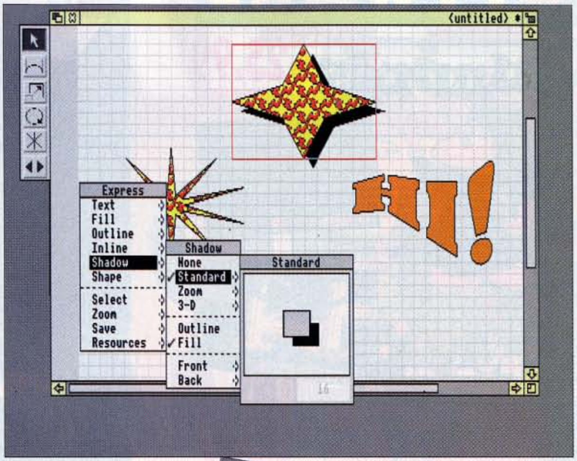
Curve Base
Envelope
User

Change the envelope for a new shape...


<untitled> *
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Outline
Inline
Shadow
Shape
Select
Zoom
Save
Resources
Shadow
None
Standard
Zoom
3-D
Outline
Fill
Front
Back
Standard
16

...or add a wall shadow. Don't like its position?

one item is selected the target point appears at the centre of all the objects treated as one.

By clicking with Adjust you can move the target point to another place.

Now by dragging with Select you can either rotate the objects around the target point or, in the case of the Scale tool, the object is scaled in relation to the target point.

For example if the target point is in the centre of the object and you start the drag with the pointer one inch to the left of the target, moving it one inch further left will double the size of the object horizontally. But as the target point is in the middle it will grow outwards to the right as well. If you make a mistake there is an Undo function that will restore most operations.

From the description here it sounds like Midnight Express is primarily a text manipulation tool. Well it certainly achieves that objective without any difficulty. However because objects can be shapes as well as text you can build up complete pictures out of the various elements.

You can save your work at any time with one of three options. Saving in Express format occupies the least space – even complex designs are typically less than 10k although a very complex file might get up to 20k. There isn't an actual Express file type – it's just Data – so you can't just double-click an Express file in order to launch the Midnight Express application.

You also have the choice of saving the whole file or the current selection as a drawfile – you can expect the file size to increase dramatically, especially if you use sprite-filled text and graduated fill shadows. Anything under 200k should be considered small.

But, very importantly, it does produce drawfiles that exactly reproduce what you put together in the Express window – even the sprite-filled lettering – which is no mean achievement in itself but absolutely vital if it's to be of any real use.

One thing that hasn't been commented on so far is speed. Even on a ARM2 machine running off floppy the whole thing is acceptably fast.

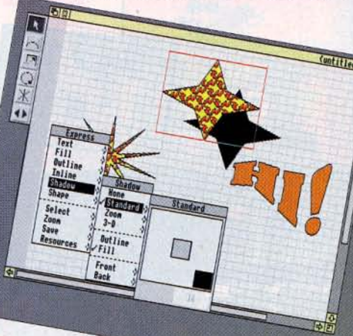
Alterations to the text are virtually instantaneous although rebuilding detailed shadows can take a while – but you can always turn them off while you edit another feature because all the settings are retained even if they're not showing.

Because of the high speed, whenever you alter one of the attributes – the colour, for example – the change is instantly reflected in the object itself, and there isn't a single OK box in the entire program. Just find what you want, click it and it's there on screen.

Summing up

Although Midnight Express duplicates many functions found in other packages it provides many that don't exist and it's very much easier to use. Professional layout artists, who use very powerful Apple Macintoshes with the latest software, were very impressed with Express's capabilities which are only available with a lot of hard work on the Mac.

This program will find application anywhere where graphics are needed from the school room to the art studio. It is superb.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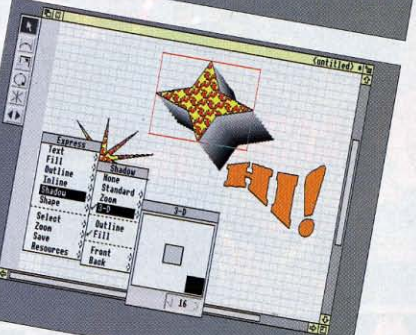
Well just shift it!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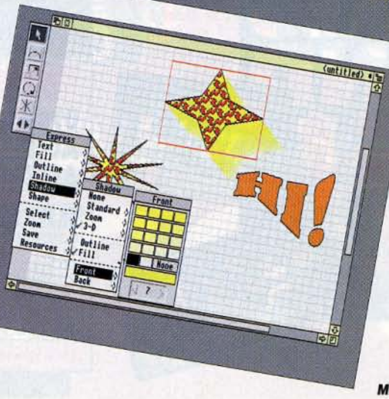
Try out a graduated zoom shadow...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...and change the colours

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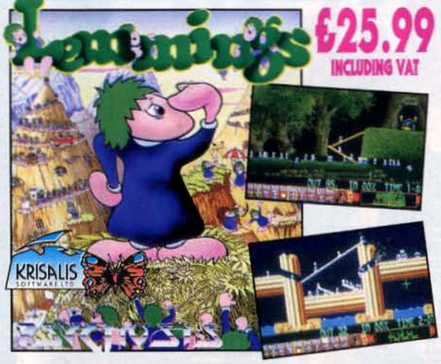

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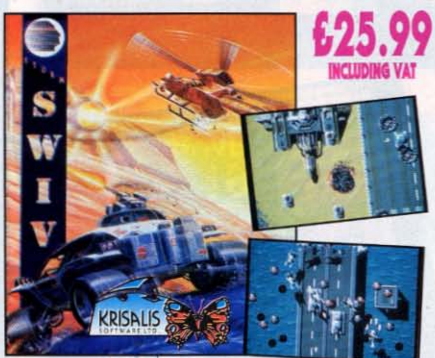

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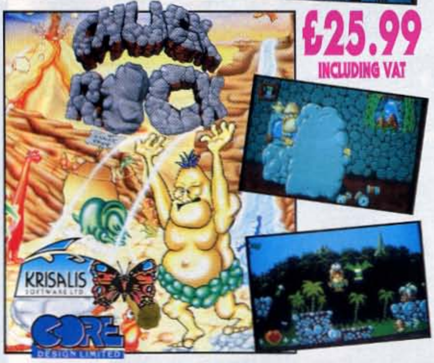

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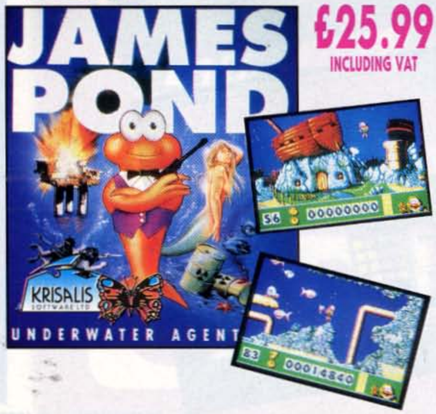

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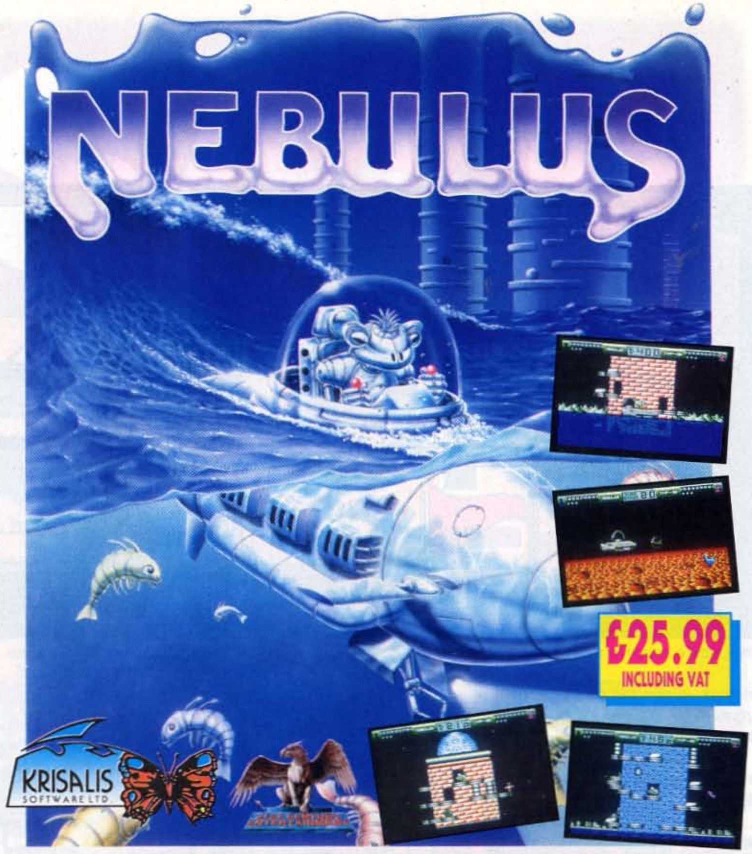

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Down on the planet Nebulus all is not well. Someone or something has been building giant towers in the sea and they didn't even apply for planning permission.
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"Nebulus is a mentally stimulating, reflex testing, light hearted game that must rank as one of the best ever releases.
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" The action grabs you right from the start and doesn't let go"
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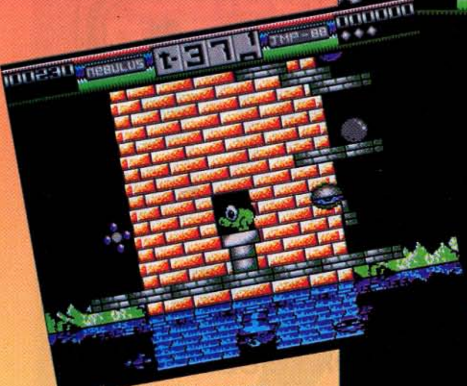
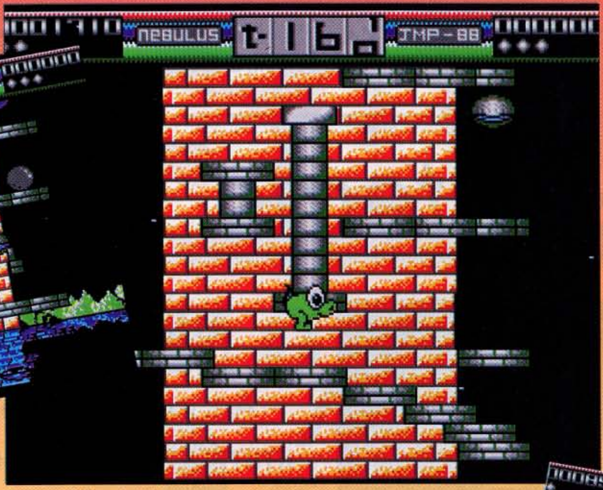
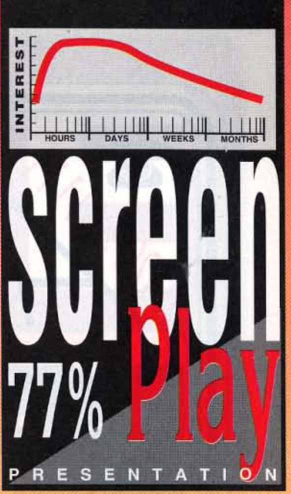
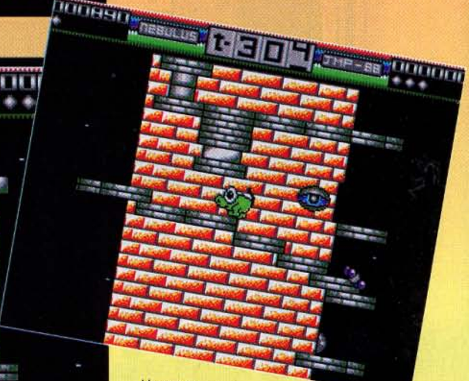


Anyone need a lift?

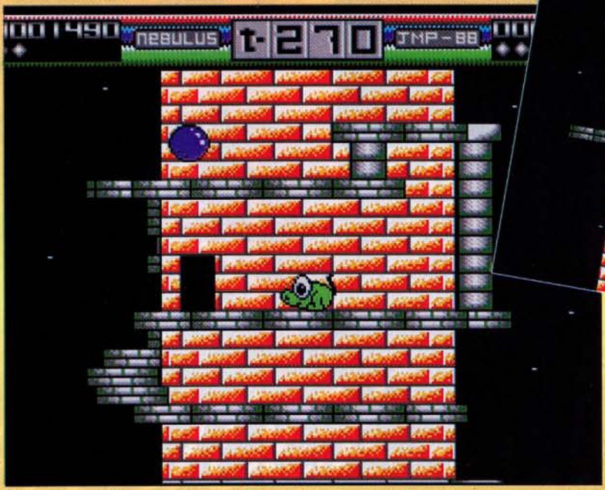


A strange falling sensation





Up we go



Let's try that again

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Nebulus

... head in the clouds

Supplier: Krisalis Software Ltd., Teque House, Masons Yard, Downs Row, Moorgate, Rotherham S60 2HD.
Tel: 0709 372290

IN the 16-bit world this game is what disc jockies might call *the one that got away* – it's novel, a little bit strange and very compulsive.

Double-clicking from the Desktop takes you through the usual Krisalis title screen and into the two between-play screens. There's a high-score table and an information screen from which you can choose single or two-player game, sound on/off, playing keys and whether you play Mission 1 or 2.

The graphics are not up to the usual standard of 16-bit games transferred to the Arc – they use a fairly low resolution 16-colour mode and this detracts a little bit when you start.

But the reason for the type of graphics becomes clear when you begin to play. Nebulus involves you, as a small green creature, climbing to the top of a cylindrical tower which has ramps and platforms round the outside and the occasional passage going through the middle of it.

This means that as little greenie walks along a platform the tower rotates so that he stays in the centre of the screen.

For a poor little 16-bit machine like an ST or Amiga the amount of power processing needed to perform the rotation trick is just too much, so they can only use a screen mode that doesn't need too much effort.

To be honest the graphics actually look like something off an 8-bit BBC Micro – despite the increased selection of colour – and if a bit more work had been put into the conversion it could have looked a lot nicer.

The object of the game is to get to the top of the tower. So you start at the bottom where a little water-craft emerges from the depths, the hatch slides back and out you get.

Then it's up to you: Walk along the platform – dodging underneath the Eye that's floating up and down – come to a raised platform, and you will climb up and down automatically.

At this point a strange thing resembling a model of an atom floats on from the left of the screen, exactly at your level – what to do? Pressing the up key reveals that this raised platform is none other than a lift which propels you up to an opening in the tower.

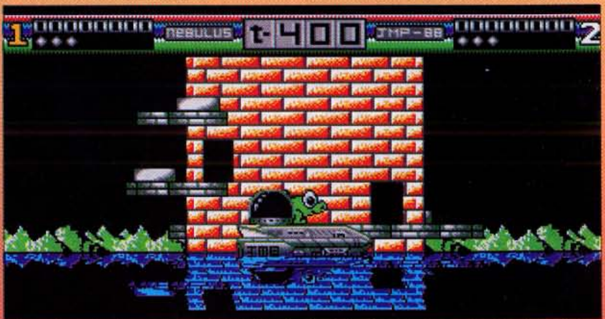
But it's not quite high enough so another press of the up key takes you into the tower, little tail wagging behind. The view of the tower rotates through 180 degrees and out you pop on to the next platform. In this manner you slowly proceed up the tower.

The kind of thing you run into, apart from oscillating eyes and floating models of atoms, are balls that move backwards and forwards, stairs where you have to keep moving forwards otherwise you slide back, and disintegrating floor areas.

All pretty standard stuff for a platform game – which this is – but presented in a novel and entertaining way.

Nebulus is a great little game, good music, quite addictive and definitely worth a go.

Geoff Brown



Standard stuff, but entertaining

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NOSHER

...chomp, chomp, chomp!

Price: £6.50
Supplier: State of the Arc, 29 West Lea Drive, Tingley, Wakefield WF3 1DH.
Requirements: Risc OS

THERE are no prizes for guessing which game this is a clone of, but there should be a prize for a company prepared to support a budget games label for the Archimedes.

Nosher is related to that old wrinkly PacMan. We have seen Pac himself on the Archimedes in the early days in the form of Pacmania from GSE, and Nosher is as hungry as his predecessor as he munches away at all the power salts.

Contrary to what you might think power salts are not good for you – but someone has to clear up the mess. These are actually uranium power salts created by one of that dying breed, an evil scientist.

Not only have these crystalline structures caused a planet-wide darkness but they have boosted the ghost population which, as we all know eat Noshers. So much so that you are the last survivor.

Probably motivated by *If I'm going to die, I'm going to take you with me* the Nosher is now collecting all the salts and cleaning the planet of uranium and ghosts.

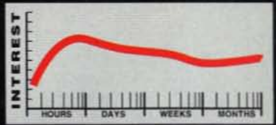
In short your task is an easy one: Collect the salts, avoid the ghosts and find the exit. There is treasure on the way and you may as well collect it as leave it – you never know you may not be the last survivor after all. There are locked doors, so do pick up the keys but most of all keep out of the way of the ghosts.

This game is very easy to get into which must make it popular with younger children, and the sprites are very large and simple.

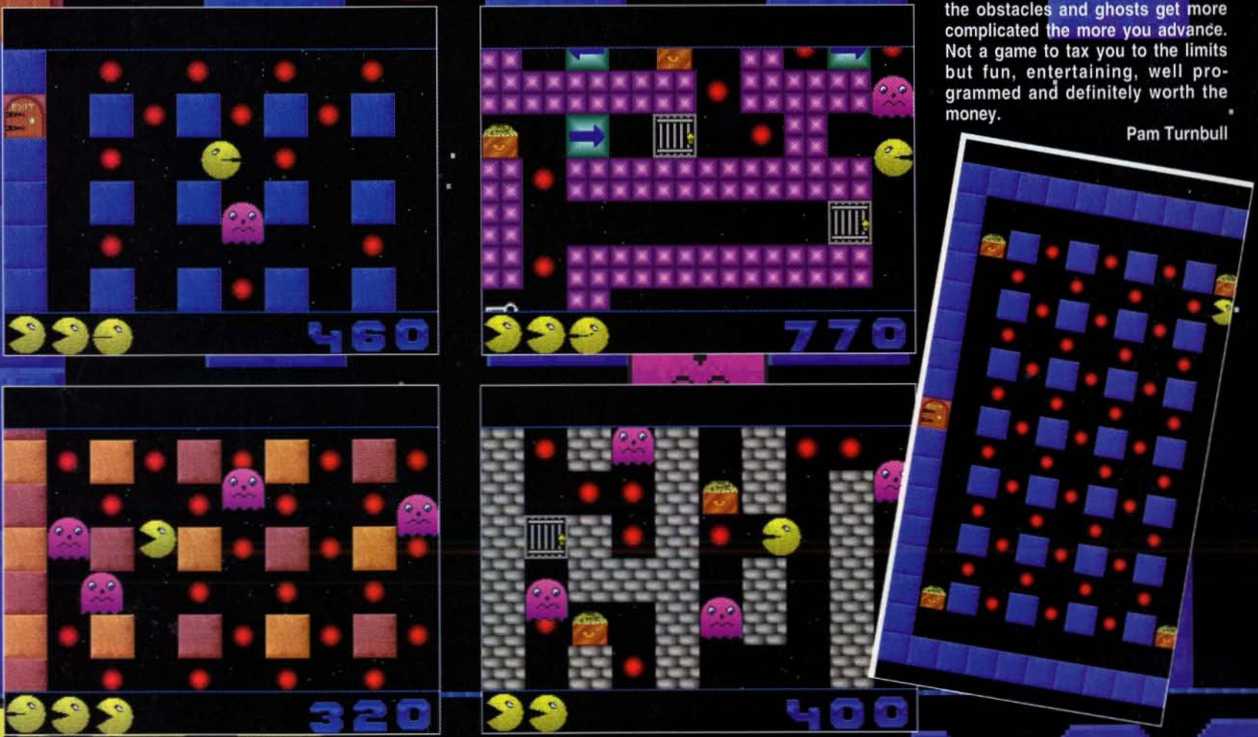
The levels gradually get more difficult and I found the hardest thing to be the manoeuvring of my Nosher round corners and into openings – the best way is to *slide* into the gaps – start pressing left or right while going up and down or up and down when going left or right.

It has some interesting mazes and the obstacles and ghosts get more complicated the more you advance. Not a game to tax you to the limits but fun, entertaining, well programmed and definitely worth the money.

Pam Turnbull



Screen Play
70%
PRESENTATION



There are lots of worlds to explore with Nosher

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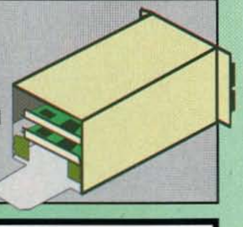

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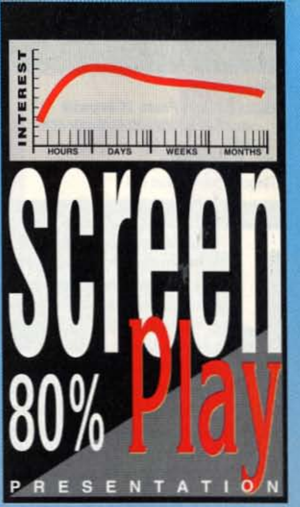
No Excuses

...griddled aliens



Price: Available on Play it again Sam 1 (Arc) compilation
Supplier: Superior Software, PO Box 6, Brigg, South Humberside DN20 9NH.
Tel: 0652 658585
Requirements: Risc OS

DID you miss this one the first time round? Well so did most people, including me. Poor old Arcana, they brought out Rotor which was pretty good but not in time to rescue them from oblivion, but by then No Excuses was already finished and it barely made it to the shelves.

It's a puzzle game with shoot-'em-up bits which uses a rather small game area but cute graphics and a very strange plot. Your mind has been invaded by aliens and in a fictional place, called the grid. You must rid yourself of them.

You control the Strider, a blobby thing with long legs, while the aliens are even more blobby with thick arms, foul mouths and bad attitudes. Did I mention they fly as well?

The grid is an eight by eight network of cells presented in a 3D isometric view. This doesn't make for a very large playing area but it's something of a compromise on a non-scrolling screen where you want the graphics to be a reasonable size.

Running the game is a simple matter of double-clicking the icon, and you won't have any problem with strange filing systems or installing it on a hard disc. It runs perfectly on all the machines and doesn't speed up on an ARM3 computer.

ARCANA
No Excuses

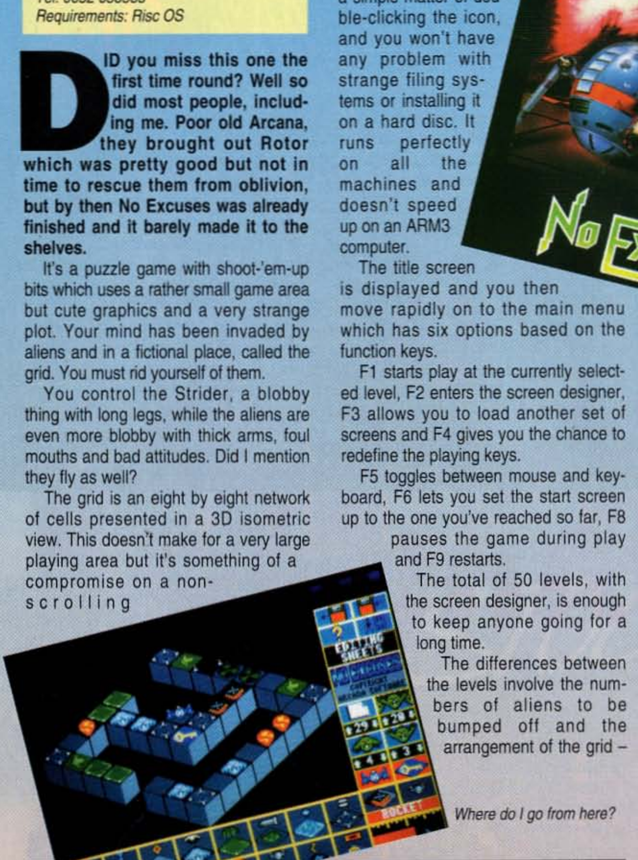
The title screen is displayed and you then move rapidly on to the main menu which has six options based on the function keys.

F1 starts play at the currently selected level, F2 enters the screen designer, F3 allows you to load another set of screens and F4 gives you the chance to redefine the playing keys.

F5 toggles between mouse and keyboard, F6 lets you set the start screen up to the one you've reached so far, F8 pauses the game during play and F9 restarts.

The total of 50 levels, with the screen designer, is enough to keep anyone going for a long time.

The differences between the levels involve the numbers of aliens to be bumped off and the arrangement of the grid – there may be gaps. So there are no passwords and you can start on any level, although the first few are graded to give a gentler learning curve.



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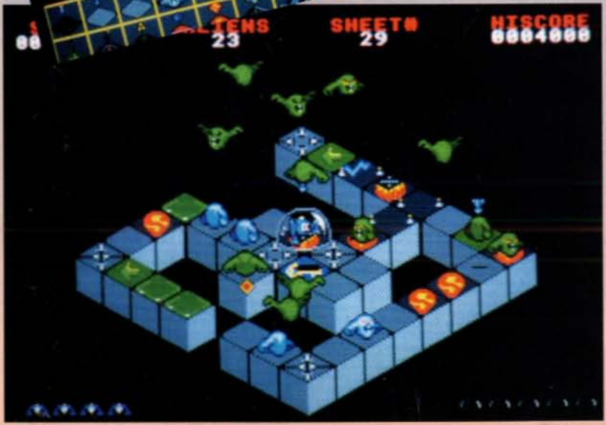
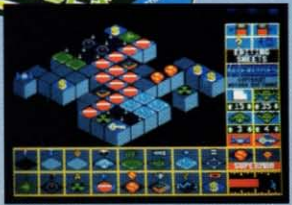


What do I do now?



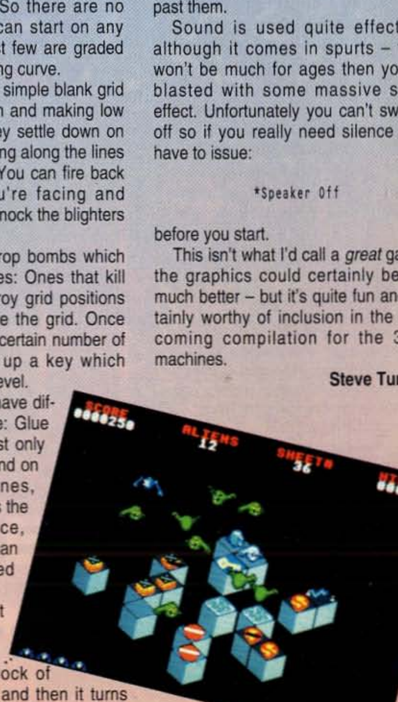
Design your own levels

The first screen is a simple blank grid with the aliens flying in and making low passes. Eventually they settle down on to the grid and start firing along the lines in random directions. You can fire back in the direction you're facing and upwards, so you can knock the blighters out of the sky.

The flying aliens drop bombs which come in three varieties: Ones that kill you, others that destroy grid positions and those that restore the grid. Once you've knocked out a certain number of aliens you can pick up a key which takes you to the next level.

The grid itself can have different types of square: Glue squares, ones that last only a short time if you stand on them, electrical ones, atomic which confuses the controls, slippery ice, smart bombs, superman (you become a caped crusader) and so on.

One of the most devilish cell types is the time bomb. This has a countdown clock of about eight seconds and then it turns into a blazing inferno for a shorter time before starting the countdown again. On some levels dozens of these are used to make movement really difficult.



Ooops

If you feel really under pressure you can put up a defensive shield which protects against low-flying aliens and bombs – you only have a limited number of these.

But it has a tactical use beyond the obvious protection – it allows you to cross dangerous terrain like slides of ice that end in certain death or long paths composed of time bombs as you can stop dead on the ice or wait while the time bomb explodes.

One plus point to the game is that there are lots of tricks you can employ to wipe out the opposition. For example on a long run of ice you can turn sideways and shoot at aliens as you glide past them.

Sound is used quite effectively although it comes in spurts – there won't be much for ages then you get blasted with some massive sound effect. Unfortunately you can't switch it off so if you really need silence you'll have to issue:

```
*Speaker Off
```

before you start.

This isn't what I'd call a *great* game – the graphics could certainly be very much better – but it's quite fun and certainly worthy of inclusion in the forthcoming compilation for the 32-bit machines.

Steve Turnbull

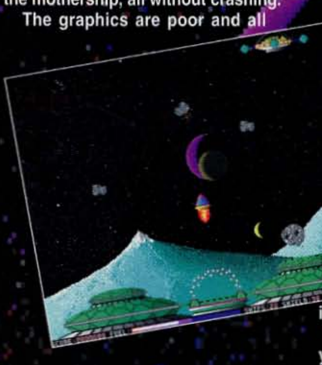
Colony Rescue

... space saving

Price: £14.95
Supplier: Dabs Press, 22 Warwick Street, Prestwick, Manchester M25 7HN.
Tel: 061 773 8632
Requirements: Risc OS

The idea behind Colony Rescue is extremely simple. Your humble rescue ship is the only chance of survival for the colonists of the contracting universe.

You must leave your mothership, float down to the ground to land on a specific target area where you must wait while you fill up with colonists. On leaving the ground, you must attempt to guide your craft back into the mothership, all without crashing.



The graphics are poor and all you are presented with is a mothership – a revolving craft with flashing lights – moving backwards and forwards at the top, while underneath asteroids move back and forth.

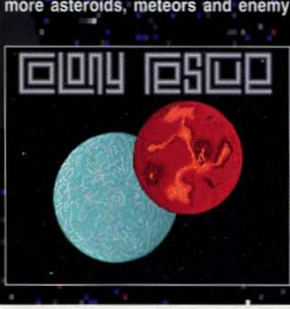
The rescue shuttle is under mouse control and you only move left or right to land on the static target, where your colonists can be found. At this point I would like to have seen a facility for keyboard control – it would have allowed ship movement to be more precise.

You have a limited amount of fuel on board which allows you to thrust away from the moving asteroids but basically it takes no time at all to land, providing you don't zoom in at high speed.

Once the colonists are on board, you take off vertically and with the help of an upward firing gun must avoid the asteroids once more and attempt to get back into the mothership.

You also have a shield fitted to your ship, but this only lasts for a short while.

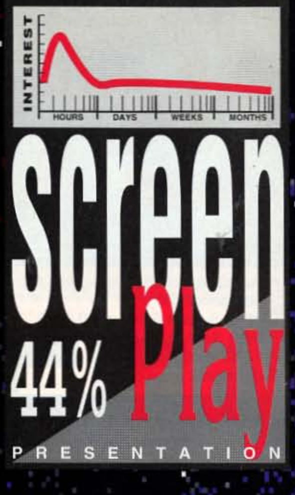
I'm afraid that's about all there is to it. Sound is not used a great deal. To make the game harder, as you pick up more colonists, more and more asteroids, meteors and enemy spacecraft appear.



According to the instruction leaflet, there are five planets, all of which must be evacuated, each progressively harder than the last. After that you enter your name on the high score table and then start all over again.

After playing for about half an hour, it became totally uninteresting. The graphics are too basic and the gameplay dull but at least you can install on your hard drive. Even at £14.95 I think you'd need to be desperate to buy this.

Brett Colley



SimAnt

... nest of troubles

FIRST there was SimCity which is available for the 8-bit BBC Micro and Electron, then SimEarth (not yet available in Acorn format) and now – SimAnt.

Just as with the other Sim programs the aim of the game is survival. In SimCity it was keeping a city running successfully, in SimEarth the future of the planet was in your hands and in SimAnt you're in charge of a colony of ants trying to grow and develop in a hostile world.

Price: £34.99 (PC version, Arc price to be announced)
Supplier: Ocean (PC version), 6 Central Street Manchester 3.
Arc version when available: Krysalis Software Ltd., Teque House, Masons Yard, Moorgate, Rotheram S60 2HD.
Requirements: PC board, hard disc and VGA screen preferable. Will work with PC Emulator.

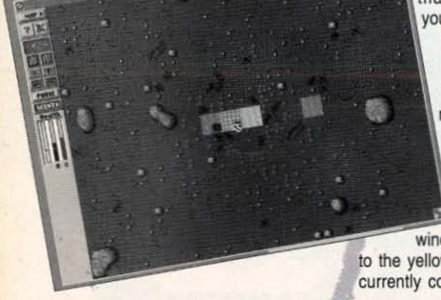
As with most PC programs you put the first disc in the drive, switch to the floppy if the hard drive is the usual default and type:

```
a:
install
```

Then follow the on-screen instructions – most of the process is automated. Once that process is completed you're ready to start and:

```
cd simant
simant
```

runs the program.



SimAnt runs in its own windows system – let's hope the Risc OS version uses the standard Wimp environment. You get a window showing the view local to the yellow ant, that's the one you're currently controlling, a general map of the area you're in and you can also access a large scale map of the whole garden and its house.

There are numerous other small windows and dialogue boxes for controlling different aspects of ant behaviour and gaining information. There are three basic games: Tutorial, Black vs Red and the Full game. There's also an experimental mode where you can do just about anything.

The tutorial is just what you'd expect, an interactive guide through the basic elements of gameplay. Black vs Red is the simple version where your Black ants are at war with the Red ants and Full game takes in all the environmental elements.

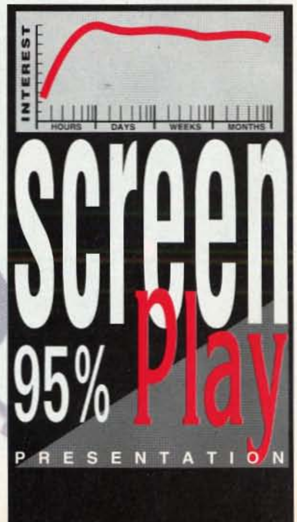
The basic idea is to gather food for your ants by locating it and guiding them to it, then controlling the breeding and behaviour by adjusting two triangular control areas.

In one you can alter behaviour between foraging, digging and nursing while the other controls what type of ant is hatched from the eggs: Soldiers, workers or breeders. These options can be controlled automatically.

There are a number of other environmental hazards: Red ants who are trying to gain control of the same area, other insects, rain, people and the spider.

SimAnt is superbly executed and a lot of fun to play. If you can wait, both SimEarth and SimAnt will be available for the 32-bit range in the next year from Krysalis. But if you can't hold on you'll have to get a PC board.

Steve Turnbull



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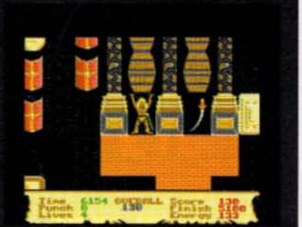
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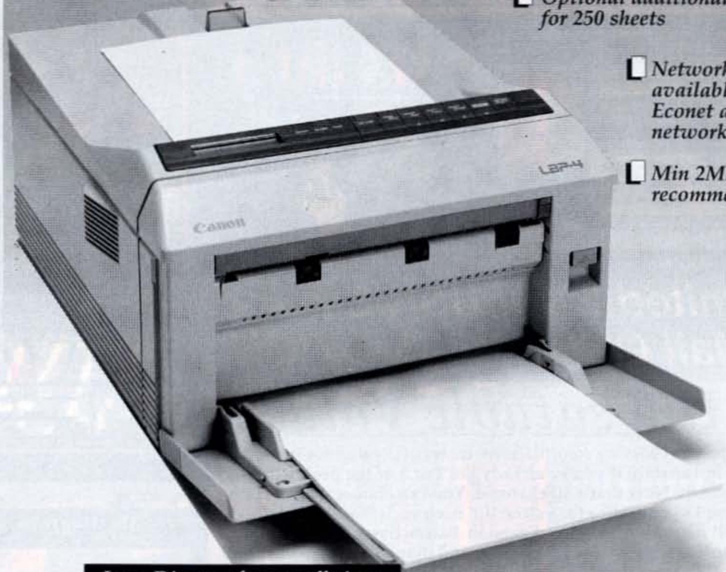

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PUBLIC DOMAIN

Libraries: More the merrier

Teri Paul wanders lonely as a cloud through the rapidly expanding world of Acorn PD

THERE seems to have been something of an explosion of new PD libraries recently – both 8 and 32-bit – a list of them is featured at the end of this month's article.

But on the down side Duncan Webster has run out of time to run the BBC Micro *8-bit Software*. He would be quite willing for one of you out there to take over from him, though he warns that it is harder work than you would think.

8BS discs have been distributed free for two years and newcomers receive a magazine too. So if you have the time and energy contact: Duncan Webster, 8BS, 7 Ashdale, Thringstone, Leicestershire LE67 8LW.

Packing them in

As everyone wants to get as much as possible on their discs it is not surprising that there are quite so many PD archivers around. John Kortink's **PackDir** is another one.

It uses LZW compression which is widely used in archivers, not just on the Acorn machines either. So it's interesting to note what is happening in the States at the moment. The LZW compression algorithm has been patented by its original authors and the company who hold the copyright are suing at least one major company for royalties.

However, because the Patents Office can take up to four years to issue a patent and because of the highly complex nature of applications they have issued two patents for the same algorithm. Some interesting test cases are promised.

Back to PackDir which is very fast. John wrote it to complement hard disc backups. Packing a directory is quite simple: Just drag it on to the iconbar icon and a save window will appear whose packed icon you now drag to a directory viewer. If you press Control while dragging a directory to PackDir it packs the parent directory, which makes it possible to pack the $ directory.

To unpack just drag a packed file to PackDir's iconbar icon, or double-click on it. Again a save window will appear and when you drag the directory icon on to the viewer it will unpack it. The iconbar menu can give you a continuous report about the actions under way.

Old path indicates the full original path up to and including the directory to be archived or being unpacked and *New path* when unpacking, shows the full path of the directory being recreated.

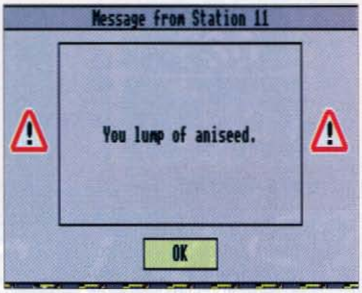
Other information gives details of the current file, the last (packing) or current (unpacking) file or directory, the number of compression bits, the compression ratio, the total file data compression, a count of items archived/ dearchived and a red bar representing the amount of original file data processed so far.

The Control window has a set of radio icons to let you select the maximum number of bits used in LZW compression when archiving a directory – 12, 13, 14, 15 and 16 bits. The more bits you choose usually results in better compression and this is especially true on large text files. However, the more bits you select the more memory you'll need to do the processing.

You also have the option to store everything in your archive or opt for the *Skeleton* when everything is stored, except file's contents. Unpacking Skeletons is done with the *Envelope* option when everything is recreated, except a file's contents. This is useful when you want to see how much room the unpacked directory needs.

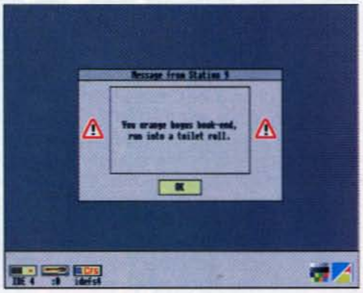
Staying with the concept of cramming information in is John Wallace who has a public domain Basic program compactor called **BasShrink**. This squashes programs by shortening variable/procedure/ function names, deleting blank lines, REMs and spaces and joining lines together.

By dragging the Basic file either to the icon on the iconbar the main options will opened automatically.


Message from Station 11

You lump of aniseed.

One insult...


Message from Station 9

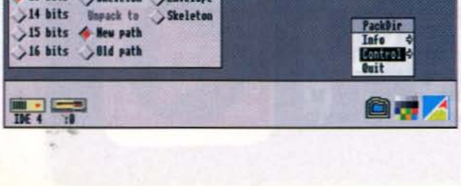
You orange bogus book-end, run into a toilet roll.

...leads to another

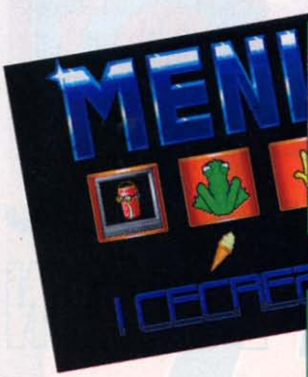
You can opt to implement the various methods by using the radio buttons.

Version 1 has been placed into the public domain but version 2, which allows concatenation of lines, is available at £5 – including the full source code. Version 3 is under development too and promises to multi-task under the desktop. This will also be £5, but there is an upgrade price £2.50 for version 2 owners.

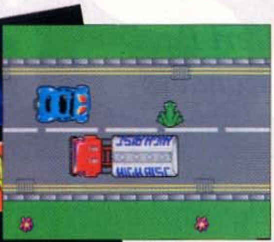
Basic64, available with Risc OS 3, has a command CRUNCH which will perform a similar function – though it's not available from the Desktop.


Compression: ● 13 bits
Store: ● All
Unpack to: ● New path
Recreate: ● All

Squeezing in the data with PackDir



The Ice cream demo menu – can you hear the music?



Would you run over a frog this size?

Mansell has nothing on this...

...but on the other hand

If you've had a really bad day you may feel inclined to load up **Insults** from Surjan Singh. This little program pops up random insult windows. It was written for a network, but do let people know that is going on as it can look very much like a virus.

The insults are a random selection of nouns, adjectives, verbs and adverbs all of which are *clean*. Though I'm not sure what an *anti-social aubergine* is.

Super demos

MHD supplied this program and a host of others including a sticky icon bar and yet another clock. But standing out from them all must be the demos. If you have not seen the Slide demo you will not know just how far above the competition Adam Toon and Andrew McLean's High Risc team is.

New from them is **Ice Cream** which needs 2Mb of ram and a MEMC1a chip – this comes as standard on most later models of Archimedes including the A3000s and A5000s. It has taken them a year and they have no plans for any more.

The icon is Mary Simpson who sucks her dummy and allows you to select which parts of the demo you'd like to skip.

Do read the film-like credits at least once at they are quite humorous and you might even find out how to make rock cakes. The demo is very polished and the graphics and music is quite superb – wear headphones – though you've never heard *Row, Row, Row your Boat* played like this before.

The program gives you a game called **Splat** which is that old chestnut Frogger but with great graphics and sound and five levels, I think. I kept dying on level two, my frog being as proficient in the car as Mr Toad. If I had finished I could have had a signed certificate, oh well.

The title comes from the pointer which becomes an ice cream and aficionados of cult films will recognise the slogan *In space no one can eat ice cream.*

The other program is **TV**. This gives you four TVs showing different digitised pictures from a host of sources. You can make sliding block puzzles from these and enjoy the superb programming.

8-bit knowhow

Frisky Clams is a new BBC software house with a wide range of software. **ColourScape** is particularly interesting – a kaleidoscope which is very effective and reminiscent of a mirrored spyglass I had as a kid. Staying with demos take a look at **VDU Madness** which is different and a tad chaotic.

Also on their books is a range of games including **Football Manager** and **3-in-a-Line**. The former is a really excellent 5-a-side soccer strategy game complete with league table and a pot luck section – keep you wits about you and you could earn some money for your beleaguered team. As a total strategy game it is very polished and I have seen a lot worse in the commercial sphere. If you are keen on football, get it.

3-in-a-Line can be played with two to four players and you must fit squares horizontally, vertically or diagonally. Though I won a couple of times I couldn't get a score, which was very strange. A tricky game whose concept will be familiar to anyone who has seen Countdown on the TV.

One type of program which keeps cropping up – in 8-bit libraries in particular – is one to help with revision and learning. My favourite is **Periodic Table** written by M. Bobrowski in Poland. It is very easy to use and gives all the information you could want: Atomic number, mass, names, chemical symbols, properties, state and oxidation states.

The standard periodic format is presented and a menu showing all the details pops up when you select an element. Experienced chemist will also find the electro configuration of atoms.

PD LIBRARIES

8-bit houses

BBC PD,18 Carlton Close, Blackrod, Bolton BL6 5DL.

Different Ideas PD, Eyton House, Eyton, Leominster, Herts HR6 0AG.

Elk PD, 5 Edward Street, Clifton, Brighouse HG6 1QR.

Frisky Clams, 37 Cassiobury Drive, Watford, Herts WD1 3AA.

GLM PD, 2 Pierrefondes Avenue, Farnborough, Hampshire GU14 8NF.

HeadFirst PD, 97 Chester Road, Southport PR9 7HH.

JD Public Domain, 7 Klembergerweg, 7214 BK Epse, Holland.

JJF PD, 49 Hollberry Close, Wingates Green, Redditch, Worcester B98 0QT.

Robert Pike, 4 Mayfield Road, Girton Cambridge CB3 0PH.

Mad Rabbit PD, 174 Duke Street, Southport, Merseyside PR8 5EL.

MasterDisc, 2 Seaview, Hoylake L47 2DD.

Re-Run, 1 Northholme Close, Grays, Essex RM16 2NX.

ScreenTeach, 21 Highlands Road, Rochdale, Lancashire.

The Wizard - BBC, Ryburn, Thorpe Lane, Cawood, Selby, North Yorkshire YO8 0SQ.

32-bit houses

Abyss Software, 35 Grantley Crescent, Kingswinford, Valley Fields, West Mids DY6 9EH.

Arcaynia, PO BOX 1927, Sutton Coldfield B74 3YZ.

ArchAngel, 9 Chancel Court, Chancel Lane, Pinhoe, Exeter EX4 8QE.

Arch PD, 109 Ferry Road, Hullbridge, Hockley, Essex SS5 6EL.

Busy Bee Computers, PO Box 25, Ormskirk, Lancashire L39 3QR.

RE Clark PD Library, Westbourne House, 34 Bradley Street, Wooton-under-Edge GL12 7AR.

Cream PD, 38 Baunton, Cirencester, Gloscester GL7 7BB.

Datafile PD, 22 Duxford Drive, Aldergrove, County Antrim, Northern Ireland BT29 4BG.

Diamond PD, 86 Meadowbank, Moor Lane, Holway, Holywell, Clwyd CH8 7EF.

DataStream, 32 Hollinwell Avenue, Wollaton, Nottingham NG8 1JZ.

Digital Illusions, 20 College Road, Wembley, Middlesex HA9 8RL.

Digital Phenomena, 104 Manners Road, Southsea, Hants PO4 0BG.

DigiTech PD, 20 Downing Crescent, Bottesfird, Scunthorpe, South Humberside DN16 3LS.

Equinox PD, 27 Station Road, Earls Barton, Northampton NN6 0NT.

Genesis PD, 19 The Greenway, Hillfields, Bristol BS16 4HB.

Low Cost PD, 6 Furzeland House, Sheephouse Way, New Malden, Surrey KT3 5PH.

MHPD, 3 Rodmell Close, Bromley Cross, Bolton BL7 9DT.

Naked PD, Fayence, Fulford Road, Fulford, Stoke-on-Trent ST11 9QT.

Ozone-Friendly PD, 180 Cumnor Hill, Oxford OX2 9PJ.

Power to the Programmers, 1st Floor, 23 Cooper Street, Nelson, Lancashire BB9 7XW.

Prime PD, 29 Tulworth Road, Poynton, Stockport, Cheshire SK12 1BQ.

Risc PD, Potteries House, Rannoch School, By Pitlochry, Perthshire PH17 2QQ.

RML PD, 24 Penryn Close, Norwich NR4 7LY.

Skyfall, PO Box 2220, Birmingham B43 5R2.

Soft Rock Software, 124 Marissal Road, Henbury, Bristol BS10 7NP.

Spidersoft PD, 218 Saville Park Road, Halifax, West Yorkshire HX1 2XS.

Telstar PD, The Jam Factory, 20 Alderbrook Close, Rolleston, Staffs DE13 9AH.

Matthew White, The Pines, 7 Peasehome, Hessle, North Humberside HU13 0HY.

Sourcing

Products mentioned in this article are credited to the PD library we obtained them from. Other libraries will often have the same programs on their files.

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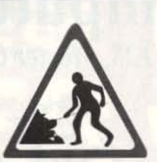
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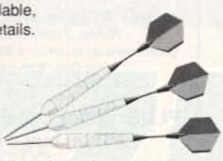
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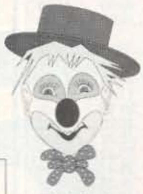
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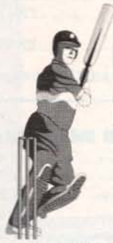
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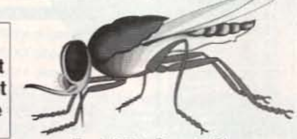
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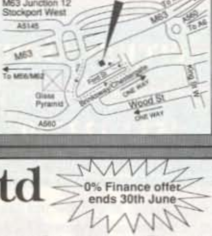

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Bruce Goatly gives the lowdown on how to produce eye-catching pages

Design by design

IN this series we have looked at the many ways in which you can make DTP software do what you want it to. However, the software is only a tool. Every tool has its purpose and the versatility of DTP is also a drawback – it makes so many effects possible that it can be hard to choose the most appropriate for a particular goal.

So now let's look at the *why* rather than the *how* of DTP by examining what makes good document design. A well-designed page is deceptive – it may look as though it just happened but the best designs are carefully planned.

An article this short can't be very detailed – there are whole books on the subject – but here are some pointers. Some of them are phrased as questions because design is about thinking first then taking charge.

Know your market

The first thing to do is to ask yourself what you're expecting to achieve with the document: Whatever it is, it may have to compete for other people's attention. So look at the document's purpose because whether it is to inform, excite, persuade or interest, it must be noticed first.

Design is all about getting your message across more effectively. This is likely to work best if you keep it simple, to avoid making the design itself, rather than your message, the centre of attraction.

Think about the relationship between you and your readers – what sort of people are they and how do you want to affect them? What sort of publication is it? Formal or informal? Will you have to grab their attention or is the publication something they will want to read anyway?

Think about the page size and shape. Should the height be greater than the width – portrait – or vice versa – landscape? Do you want a poster? A magazine? A birthday card? A menu? An advertisement? A newsletter? Each has an arrangement appropriate to its purpose.

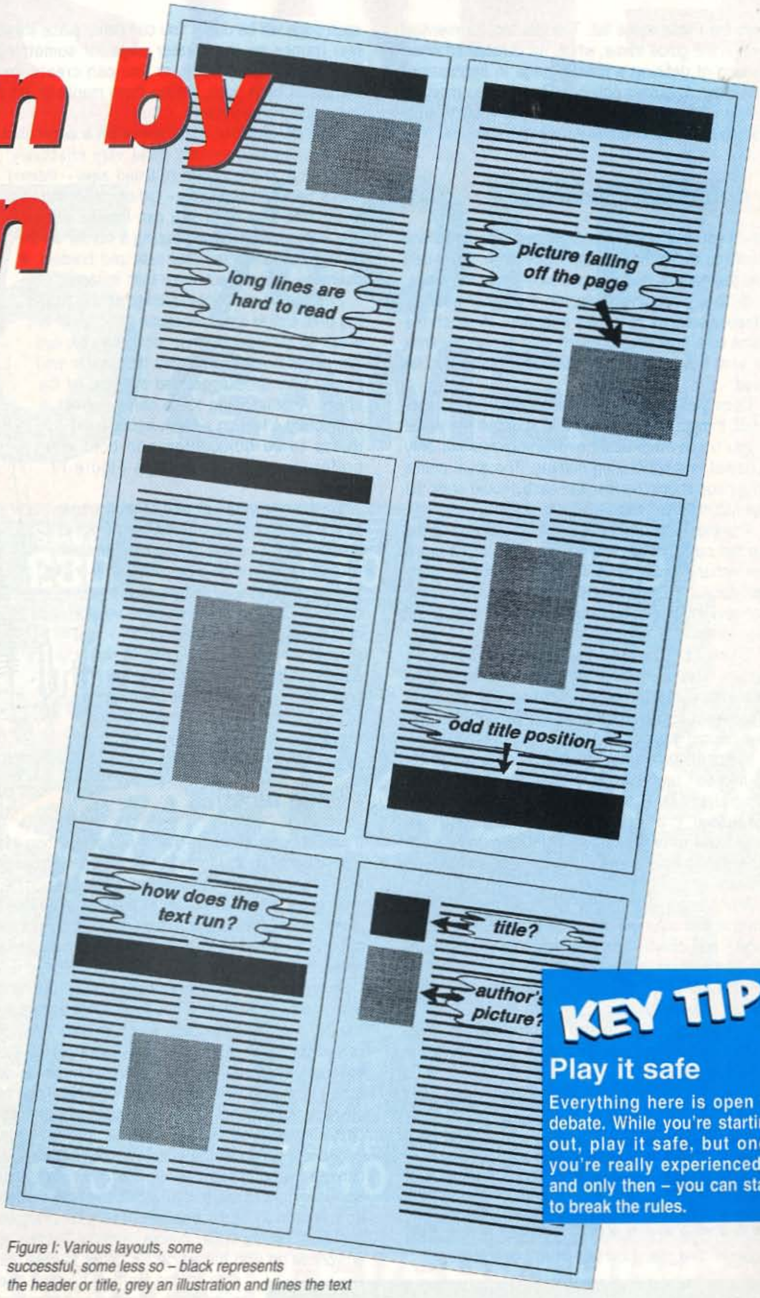


Figure I: Various layouts, some successful, some less so – black represents the header or title, grey an illustration and lines the text

KEY TIP

Play it safe

Everything here is open to debate. While you're starting out, play it safe, but once you're really experienced – and only then – you can start to break the rules.

Tools of the trade

When starting a design it's very tempting to sit down at the computer and doodle. Unless the layout is extremely simple or based on an existing prototype, resist the temptation – use a pencil and paper instead for your first thoughts. After all, your end product will be on paper, so it's a good place to start.

Only after you've formed a good idea of what your document will look like should you transfer the elements to your DTP program, positioning frames for text and graphics roughly at first – display the page at a small scale. Then move things around until they're where you want them. Before you do this, though, you may want to draw a page grid which we will cover later.

Don't forget Impression's page rulers – you can call them up on screen from the Preferences dialogue box which we saw briefly a few months ago. Although they cut down the amount of page visible on screen they are invaluable when translating from paper to screen.

Other Impression tools at your disposal are the Alter Frame dialogue box and the numbers that appear on screen whenever you resize or move a frame. The units used on the ruler scales and for the numbers can be changed to suit you, again

Check out our special reader offer on Bruce Goatly's book – *DTP for All*

from the Preferences list. The last tool for mention here is the guide frame, which we considered when looking at defining a master page in Impression. The *Snap to guides* option in Preferences must be turned on if you want to use them to position local frames accurately from page to page.

A matter of balance

When you go to a party and everyone else is talking loudly to make themselves heard over the music and the general hubbub, you have to do the same. In a library reading room, on the other hand, a whisper suffices to attract attention. In much the same way, how you approach your design depends on what it is up against and how it is intended to be used.

Once you've drawn someone's attention to your page, though, you don't have to shout all the while. If you try to emphasise everything you will only succeed in emphasising nothing. The focal points on a page should be few and each should draw the eye naturally to a message.

The most obvious focal point for a title is at the top but other places are just as valid. Illustrations can enhance your page if carefully placed or they can spoil it. Figure I shows some layouts of title, text and illustration and some are more successful than others.

If you have several pages to fill, use a grid system. This is useful with magazines, books and newsletters as it helps you make consistent use of your pages. Figure II gives examples of three- and four-column grids.

Notice that the page layouts aren't symmetrical as this can be boring in a long document – *The Micro User* has an asymmetrical grid layout for just this reason. In an asymmetrical layout, left and right pages are often designed differently from each other to let each pair of pages form a balanced whole.

An A4 page – 210mm by 297mm – can take two, three or four columns of text comfortably and an A5 page – half of A4 – can take one or two, as long as the type size is suitable. If the text type is too big for the line length you will have problems with large spaces between words.

If you place guide frames on your master page, based on your grid, half of your layout work for each page will be done. You can either place linked text frames on the master page for something continuous like a book, or you can create text frames on each page, linking them manually, for a magazine or newsletter.

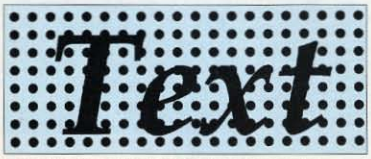
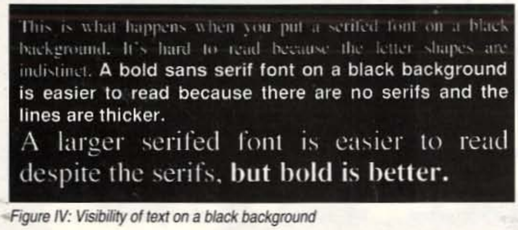


Figure III: Text getting lost on a tinted background



This is what happens when you put a serifed font on a black background. It's hard to read because the letter shapes are indistinct. **A bold sans serif font on a black background is easier to read because there are no serifs and the lines are thicker.**

A larger serifed font is easier to read despite the serifs, **but bold is better.**

Figure IV: Visibility of text on a black background

Don't be afraid of white space on a page as it can act to offset printed areas very effectively. You can also use panels of tinted area – frames with a background colour – either containing text or by themselves. Or you can isolate areas of text with boxes made by putting a border on the frames but remember that tints and borders, if overused, can distract rather than attract.

Putting text on a tinted background is risky if the print size is small, because the dots of tint break up the letter outlines, confusing the eye. We saw something like this last month and Figure III is an exaggerated example of the effect. Another thing to be careful about is putting white text on a black background – it needs to be quite large and bold and preferably without serifs as Figure IV shows.

To get an overall picture of your pages as you build them up you can view them at small scale on screen, or you can print out *thumbnails*, which are reduced-size pages. Impression 2 has many print options – but the demonstration version of Impression Junior doesn't print – and among them is the ability to fit many pages on one printed sheet. So it's possible to print each document page at 25 per cent, with perhaps 16 on one sheet.

Page niceties

If your document is more than a few pages long it is a courtesy to your readers to keep them informed of where they have got to by including a page number and possibly also a header or a footer. You don't have to be fancy about it – top left and top right for numbers on facing pages will do – but there is scope for individuality. Within reason, of course.

Arranging text attractively over several columns can be more difficult than you might think and fitting it into a pre-determined space can be harder still. If you have too much or too little material for the space allowed you might be able to compress or expand the type size, the spacing between lines or the font aspect ratio – but only small variations will pass unnoticed, so use with caution.

If you're acting as the editor of a publication and can't get a contribution to fit any other way, you have the right to make changes to the text, though do it sensitively and if possible have your changes approved by the writer before printing. If there is artwork to go with the article it's better to alter the size of the frames holding the pictures to give the text more or less room.

Multiple column work can be awkward because columns should ideally match in length. However, sometimes the last line of a paragraph will appear at the top of a column – a widow – or the first line at the foot of one – an orphan. In the best circles these are avoided, and the quickest way is to create a frame over the last line of the column containing the orphan or preceding the widow, repelling a line of text into the next column. If you can balance all the columns by making a single-line frame across the foot of them all, you should.

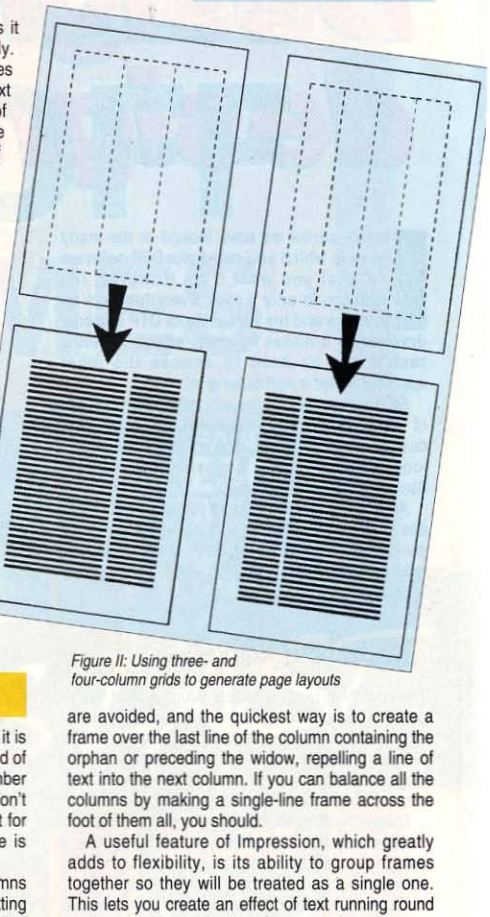


Figure II: Using three- and four-column grids to generate page layouts

A useful feature of Impression, which greatly adds to flexibility, is its ability to group frames together so they will be treated as a single one. This lets you create an effect of text running round an irregular illustration, in a few easy steps.

First drop the graphic into a non-repelling and transparent frame over the text, placed roughly where you want it, then make the graphic the right size. Next create a set of transparent but text-repelling frames, each the height of a line of text – the easiest way to do this is to make one the right height and transparent and then copy it several times with Ctrl-C and Ctrl-V so that the whole graphic is eventually overlaid in strips.

Next, adjust the length of each repelling frame so the text flows neatly round the graphic with as much of a clear border around it as necessary, then select all the strip frames and the graphic frame together – click on each one while holding down the Shift key – and choose Group frames from the Frame submenu. If the graphic frame is completely buried by other frames, select it first with Alt-Select, then add the others to the selection before grouping them all. It's as easy as that.

- *Next month we'll conclude the series by looking at printing and multiplying your document.*

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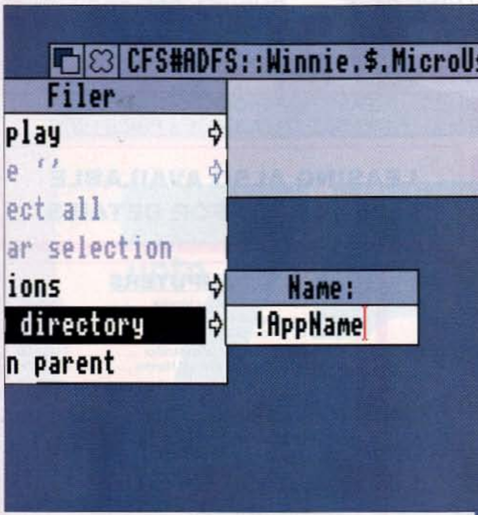
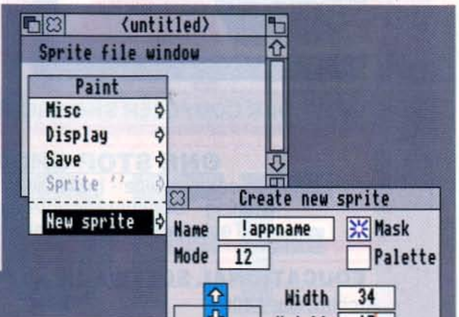
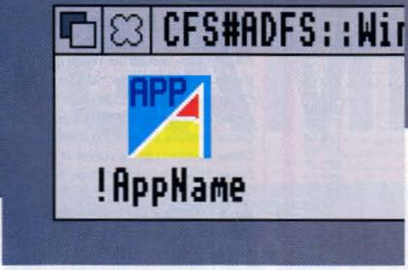

CFS#ADFS::Winnie.$.MicroUser.Test
Filer
play
e ''
ect all
ar selection
ions
directory
n parent
Name:
!AppName

Creating the application directory

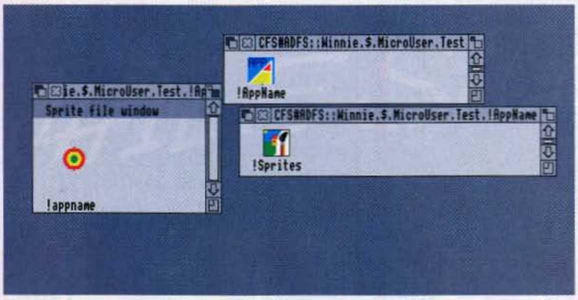

<untitled>
Sprite file window
Paint
Misc
Display
Save
Sprite ''
New sprite
Create new sprite
Name !appname
Mask
Mode 12
Palette
Width 34
Height 17
OK

Creating an application icon sprite

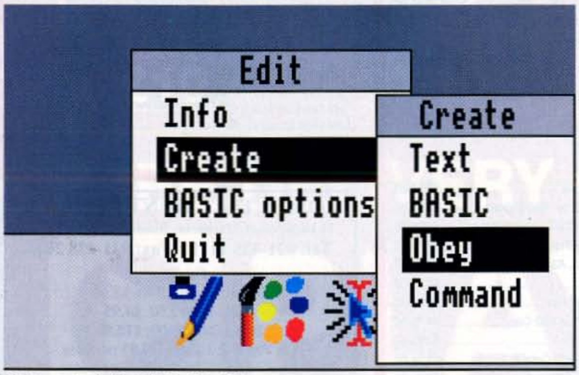

CFS#ADFS::Wir
APP
!AppName

What the basic application directory looks like

Icon see clearly


CFS#ADFS::Winnie.$.MicroUser.Test
!AppName
ie.$.MicroUser.Test.!Ap
Sprite file window
!appname
CFS#ADFS::Winnie.$.MicroUser.Test.!AppName
!Sprites

Saving the icon into the application directory


Edit
Info
Create
BASIC options
Quit
Create
Text
BASIC
Obey
Command

Making a simple !Boot file for Risc OS

CREATING applications for the 32-bit Risc OS machines isn't the easiest thing in the world, but Acorn didn't make it any easier by spreading the information through the four volumes of the Programmer's Reference Manual. So here are the basics that you need to get right.

Any application consists of a number of files within a directory and the directory name must begin with !, for example:

```
!AppName
```

With a Filer window open on to your workdisc, click Menu, locate *Create directory*, slide off the arrow and a writeable area appears where you can type in the name of your application.

Simply creating a directory like !AppName, will generate it with the default APP icon. If you try double-clicking it you'll get the error: *File '...!AppName.!Run' not found.*

One reason for creating an application directory is so that you can have an interesting icon for your program. The icon for the application is held in a sprite file called *!Sprites* which is held inside the application directory.

To create the sprite file you'll need to load up !Paint and click on its icon to create a new file. Risc OS 3 !Paint automatically brings up the create new sprite dialogue box but the majority will need to click Menu over the sprite file window, move down to the *Create* option and slide across to bring up the dialogue box.

As a minimum the file must contain a sprite called *!appname* – all sprites have lower-case names. The sprite must be Mode 12, with mask but no palette, size 34 across 17 down. So fill in and click the boxes as appropriate then click OK. Now double-click the sprite in the file window to bring up the edit window.

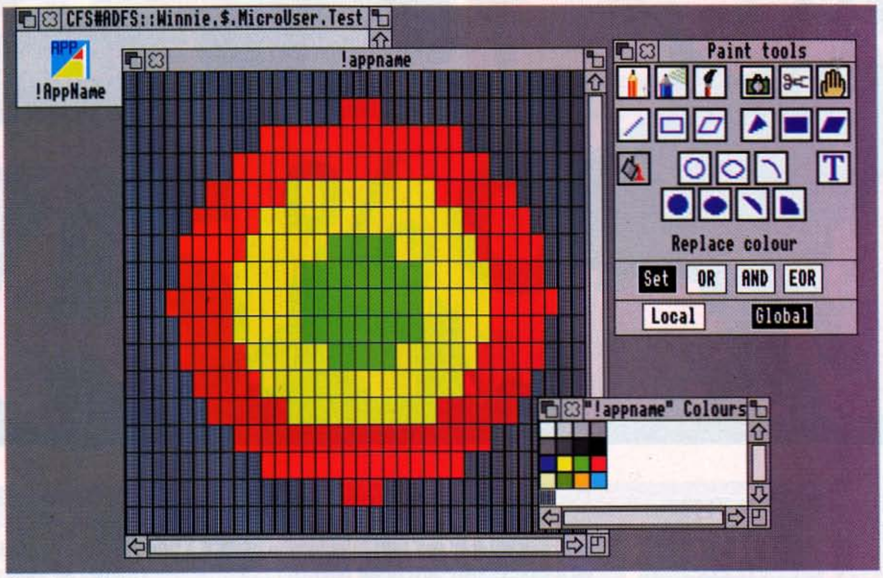
Design factors

From the sprite menu zoom the sprite up to x12 size and show the colours. Now you can create your masterpiece but there are a some design considerations: Application icons don't have a black border, only files created by an application – for example check out the difference between the Edit and text file icons.

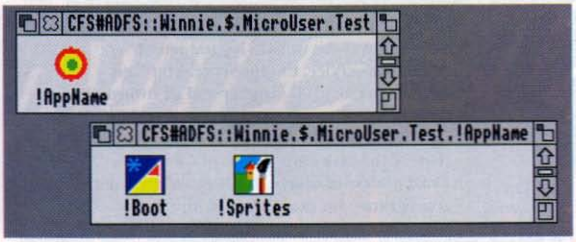
Any background colour must be transparent – try clicking the !Paint icon in a Filer window and see how it's only the coloured parts that change colour not the background.

Steve Turnbull reveals the essentials of creating your own applications

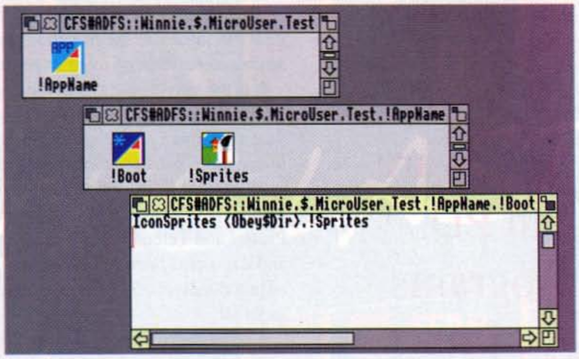
now


CFS#ADFS::Winnie.$.MicroUser.Test
APP
!AppName
!appname
Paint tools
Replace colour
Set
OR
AND
EOR
Local
Global
"!appname" Colours

A simple icon design


CFS#ADFS::Winnie.$.MicroUser.Test
!AppName
CFS#ADFS::Winnie.$.MicroUser.Test.!AppName
!Boot
!Sprites

The finished application icon on display


CFS#ADFS::Winnie.$.MicroUser.Test
APP
!AppName
CFS#ADFS::Winnie.$.MicroUser.Test.!AppName
!Boot
!Sprites
CFS#ADFS::Winnie.$.MicroUser.Test.!AppName.!Boot

```
IconSprites <Obey$Dir>.!Sprites
```

What's in the !Boot file

Finally the icon itself shouldn't be based on an English language pun it should simply try to indicate what the application does. This is to aid non-English speakers in recognising what your application is for.

So now you've created your icon and it's sitting in the sprite file, where do you save it? It has to go inside the application directory but double-clicking that produces an error. Instead double-click !AppName while holding down Shift – the directory now opens up and is, naturally enough, empty. The sprite file containing your icon needs to be saved here and must be named !Sprites.

You'll find that !AppName in the Filer window still doesn't appear with your icon. If you have Risc OS 2 all you have to do is close the Filer window then re-open it and if all is well !AppName will now appear with your icon. On Risc OS 3 this doesn't work because the newer operating system is too clever.

The quick fix is to load up !Edit and from the iconbar icon menu select the Create=>Obey option and type in the following line:

```
IconSprites <Obey$Dir>.!Sprites
```

Now save this file, named *!Boot*, into your !AppName application directory. Once it's there all you have to do is double-click on !Boot and your icon will appear in place of the APP icon.

● *In the next article in the series we'll take a close look at a full !Boot file and the !Run file.*

More on !Sprites

There may also be a sprite called *sm!appname* which is the icon used when the Small icons or Full info options are selected from the Filer=>Display submenu. If it doesn't exist, the full icon is scaled down which may not be satisfactory. The small icon must be 19 across by 9 down and may differ from the full sized icon for clarity but similarity is preferable.

If the application has a file type associated with it, two further icons are required: *file_XXX* where XXX is the hexadecimal code of the filetype, for example FFF for text, FFB for Basic and so on. This icon is the same size as the large one and should contain the same image but has a black border. Similarly *small_XXX* is a version of sm!appname with a black border. Check out the !Paint.!Sprites file for an example of what can be put in one of these files.

The !Sprites file may also contain other sprites which may belong in the general sprite pool. This must only be sprites that may be required by other applications, such as the Filer, for displaying file types.

You can also have two further sprite files: !Sprites22 and !Sprites23. The former is the same set of sprites but designed in Mode 22, having 16 colours, square pixels and twice the vertical resolution (34x34), used on multi-sync monitors.

The latter is the same set again but defined in Mode 23, which is two colour (mono) but with double the vertical resolution (34x34).

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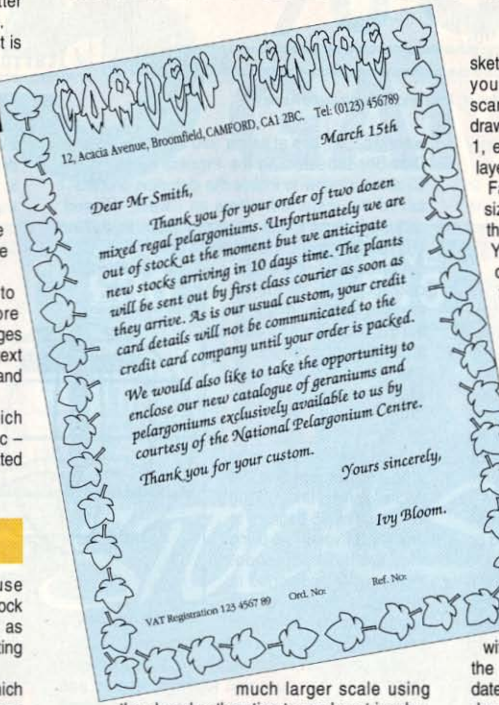
Steve Bruntlett shows you how to create professional looking letterheads

Billet dos and don'ts



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March 15th

Dear Mr Smith,

Thank you for your order of two dozen mixed regal pelargoniums. Unfortunately we are out of stock at the moment but we anticipate new stocks arriving in 10 days time. The plants will be sent out by first class courier as soon as they arrive. As is our usual custom, your credit card details will not be communicated to the credit card company until your order is packed.

We would also like to take the opportunity to enclose our new catalogue of geraniums and pelargoniums exclusively available to us by courtesy of the National Pelargonium Centre.

Thank you for your custom.

Yours sincerely,

Ivy Bloom.

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ONE OF the main uses for home computers – as long as you have a printer – is correspondence. It's very easy to use a wordprocessor to produce straightforward letterheads. You may have already tried this with Edit. But you might want to be a bit more adventurous than just putting your address at the top of the paper.

You can design your letterhead using DrawPlus and print out a few sheets on which to write your letters or you can start to use a pre-designed letterhead in conjunction with Edit for each letter with a series of letterheads for different purposes.

There are various type of letterheads. The first is pure text and can come in a variety of forms such as a block on the right hand side of the paper or centred or in a couple of lines across the top. To produce this type all you need to do is to type your address into Edit and drop it into DrawPlus.

It will have the standard text header attached to it which will need the AD command changing to AL to change alignment from both sides to the left hand side of the text box or to AC to centre the address.

You can also edit the text file within Edit to produce a different font, style and size before dropping it back into DrawPlus where such changes take effect. If you prefer you could type the text directly into DrawPlus – there are advantages and disadvantages either way.

The second kind of letterhead is one which combines the address with some kind of graphic – a panel alongside the address or a more integrated panels of graphics and text.

Home alone

The first example has a drawing of a house produced with DrawPlus and an address text block created in Edit. The drawing is not complicated as it's been drawn using a fairly coarse gridlock setting and mainly boxes.

Windows comprise three grouped boxes which are copied, flipped or stretched to produce a range of variations without any extra drawing. You could spend a long time putting detail into a drawing but keep checking how much you can see in the printed letterhead as you go along to save yourself unnecessary work.

The fancy blocks at the front were produced at a much larger scale using the closed path option to produce triangles, scaled down and repeated to fit the drawing. A single line thickness is all that was required for this drawing but you might like to experiment with different line thicknesses to highlight parts of your drawing.

You don't have to spend time outside your house sketching as you can always work from photos. If you want to produce something accurate try scanning the picture first, putting that into your drawing on layer 0 and doing the drawing on layer 1, either deleting the scanned image or turning layer 0 off when you print.

Failing that you can enlarge the picture to the size you want, photocopy it on to acetate, tape that over your monitor and try drawing behind it. You could always load the scanned image directly into DrawPlus which would save a lot of time but you wouldn't learn anything about drawing.

Getting the text right

Aligning the text block is a matter of moving it into position or resizing it. This can be done with the Select box handles, by selecting one of the handles or the text block and using the cursor keys for fine control rather than the mouse while keeping the mouse button depressed.

You may find that the spacing of the lines of text needs a bit of adjustment. This can be achieved very simply by adding an extra line spacing command within the Edit text file and adjusting its size until the lines are correctly spaced. This was how the date line was lined up with the bottom of the house drawing.

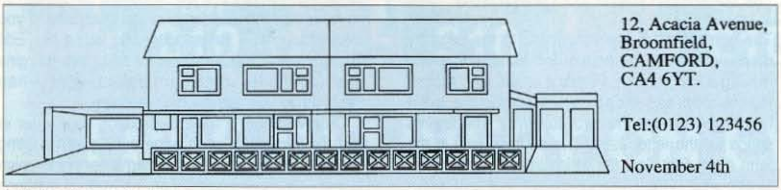
Fine tuning can make a great deal of difference to the visual appearance of a letterhead and is worth taking time over. Try and get used to mastering the system rather than it dictating to you.

Down to business

The business letterhead uses the drawing used for the business cards. This illustrates one of the main points of computer-based graphic design with artwork being saved and used in a variety of different contexts. But I've gone further than just placing the graphic panel alongside the address as a title panel links the graphic design with the address in a more harmonious way.

The title panel was achieved by typing in the text, adjusting the size and turning it into a graphic object which allows you to produce text in outline form or filled in a different colour.

The church letterhead on the left shows a different layout. If you have previously entered a text block you can change the font, style or size by selecting the text block, changing to Edit mode and



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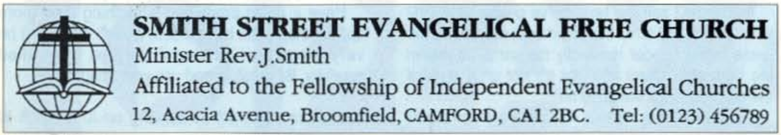
CA4 6YT.

Tel:(0123) 123456

November 4th

Letterhead house drawing



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Minister Rev.J.Smith

Affiliated to the Fellowship of Independent Evangelical Churches

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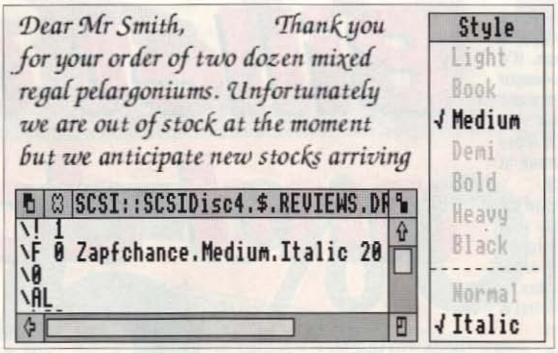
Incorporating a logo on a standard letterhead

> *You could spend a long time putting detail into a drawing, but keep checking how much you can see...*


Dear Mr Smith, Thank you for your order of two dozen mixed regal pelargoniums. Unfortunately we are out of stock at the moment but we anticipate new stocks arriving

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SCSI::SCSIDisc4.$.REVIEWS.DR
\! 1
\F 0 Zapfchance.Medium.Italic 20
\0
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Matching fonts and Edit command names

using the Text style menu to change the text block. If you change the text to a graphic object you'll find that the Text style menu is no longer selectable denying you access to the font, style of size submenus.

By using a reduced version of a logo designed at a larger scale, reducing it and using the Transform option you can proportionally reduce the line thicknesses as well which seems to give perfect results every time.

There are various ways you can treat text including changing it to graphics and producing outline forms, skewing or rotating it, and altering the shape by using the Edit menu. Text can also be distorted into new shapes using a program like DrawBender. This needs to be handled carefully to be effective and can easily look gimmicky.

The other option is use different weights or styles. These can be found by looking at the Fontstyle menu. You can use Adjust to see what effects the different weights and styles have on the text currently selected.

Integrating the whole

The third kind of letterhead makes the whole surface part of the design with space for your letter somewhere within it. This is like the stationery you might give or receive as presents but there's no reason why you shouldn't either produce your own fancy stationery or produce various kinds semi-commercially if you have access to a laser printer.

This type of design has a lot in common with the production of frames dealt with earlier. I worked on a full page design for a garden centre. You could opt for one containing drawings of tools for a mechanic, cartoons for children's stationery, or figs, ginger and chick peas for a cook. There are many options open using either commercial clip art drawfiles or, preferably, your own.

You need to decide what the main components of the design are and what will be used as the source for the design round the edge and at the top. Where will the address be and how much, if at all, will it be integrated into the design? I used the same ivy leaves used on the Christmas card for the border on three sides and decided to try something a bit more adventurous at the top using DrawBender.

Distorting letters into ivy leaf shapes may be a bit crass but it seemed like a good idea at the time and illustrates the point I'm trying to make. I didn't even have to draw a mould to use with DrawBender – I used the ivy leaf itself, albeit with a slight modification.

I removed the stalk by selecting the points at the ends of the lines I wanted to delete and used the Delete point option from the Edit menu tidying up one or two control points which were now a bit out of place.

I then dropped it into the Skeleton window of DrawBender and moved a couple of the control points of the DrawBender skeleton to make the results clearer.

I produced a series of single letters using a plain but chunky font similar to Homerton Bold. These were dropped, one at a time, into the Full window of DrawBender selecting the Process option in the Skeleton window to initiate the distortion process. I saved the distorted letters as I went, aligned, reduced slightly and changed them to outline graphics by altering the line width to 1.

I also modified the line colour to black and fill colour to white. They're not as good as they might be but they're reasonably easy and quick to produce so you can spend time experimenting until you're fairly happy with the results.

The ivy border was produced by reducing the original ivy leaf and rotating 24 copies by 15 degrees to produce 24 variations using the Rotate/Skew option. These were positioned in sequence down the left hand side of the letterhead and part way across the bottom to the centre.

After some fine adjustment using the cursor keys these were then collected together, copied and reversed. However, this only reversed the leaves relative to their own positions and didn't reverse the whole block to give a mirror image of the left hand side. What I should have done was group them first!

From borders to graphics

The graphic block was loaded on to the page by dropping it on to the bottom left hand corner and moving it into position. Finally a space was allotted for the address fitting neatly under the main heading between the two borders. This leaves space for the letter itself. The address was in the form of an Edit Text file which is easy to position, space and format. I also added *Vat* and *order numbers* to make it look more businesslike.

If you can't see the text you've produced in Edit when it's loaded on to the letterhead, make sure the name in the header is exactly the same as that in the Font style menu and that it's not on a layer of the drawing that's switched off!

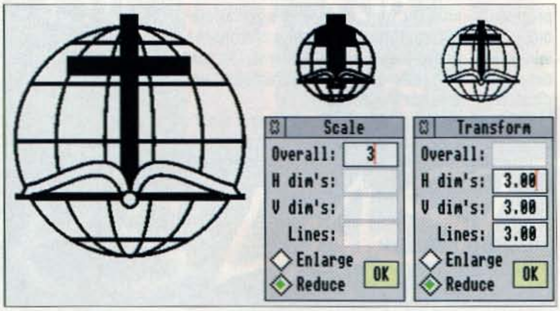
If you saved the settings for DrawPlus with layers set you need to switch these off before you start and resave the settings. You can still do this while working on a drawing. All that happens is that a message is displayed by DrawPlus informing you that it's moving everything to layer 0.

Outputting the results

The production of letterheads is quite straightforward but relies on your ability to initialise your printer with the correct margins set on your preferred printer driver to produce single sheet or continuous stationery.

Standard printer paper is shorter than A4 and is usually of poor quality. It's generally thinner than good quality writing paper but better paper is available. If you're ordering fanfold paper try ordering 80gsm quality which is more expensive but is comparable to that of writing paper. If you're using single sheets there's no reason why you shouldn't use actual writing paper though this is a bit fiddly to get into the printer.

To produce A5 letterheads you can either scale down an A4 by 66 per cent and trim it, or you can print two by rotating the original through 90 degrees and then copying it, laying them out side by side, printing and then cutting them in two.


Scale
Overall: 3
H dim's:
V dim's:
Lines:
○ Enlarge
● Reduce

Transform
Overall:
H dim's: 3.00
V dim's: 3.00
Lines: 3.00
○ Enlarge
● Reduce

Scale and transform

However, you will need to change any text to graphics before you rotate the letterhead which rules out the use of text files unless you work on an A4 landscape format drawing to start with.

You can produce the text of your letter in the same way as the text file you may have produced for address blocks and so on. These can be saved as letter files independently of the letterhead. If you were producing a longer letter you would use Edit like any other wordprocessor setting the margins and indent to whatever looked right when overprinting your pre-printed stationery.

Otherwise you'd have to produce your letter in text file panels for each page cutting and pasting between them to get the finished letter right, which is probably more trouble than it's worth. I suppose you *could* always write your letters by hand...

Have a go at producing something a bit more special than plain letterheads, though these can be very elegant or striking if the text is handled carefully. Be creative and use your imagination.

- *Next month we'll be moving on to a touch of cartography*

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(B) BBC B (M) Master 128 (C) Compact (A) Archimedes

Watford Electronics

(A member of the Jessa group of Companies – Established 1972)

Jessa House, 250 Lower High Street, Watford WD1 2AN, England
Tel: Watford (0923) 237774 Tlx: 8956095 Fax: (0923) 233642

Acorn

The sign of Quality

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.

All prices exclusive of VAT; subject to change without notice & available on request.

The choice of Experience

Archimedes micro

System	Basic	Mono	Colour	Multiscan
A540/1	£2495	£2555	£2655	£2815
A3000	£599	£665	£759	£924
A3000L/C	£642	£708	£802	£967
A5000H/D	–	–	–	£1499
A5000L/C	–	–	–	£1531

Unbeatable Sale Offers on Archimedes Micro

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

Micro	Free Offer
A540/1	Multiscan monitor with VIDC enhancer and LC20 Printer
A3000	2Mb RAM; Monitor plinth and Acorn's A3000 Shoulder Bag (carrying case)
A5000	Upgraded to 4Mb RAM

Plus of course our no quibble 12 months FREE On-Site Maintenance on all above Micros.

A5000 – 100Mb 18mS Hard Disc Upgrade	£269
A5000 – 210Mb 18mS Hard Disc Upgrade	£459

Archi Accessories

• 3.5" 800K 2nd Floppy Drive (305/310)	£118
• 5.25" 800K external Floppy Drive	£85
• I/O Podule (Analogue/User/1MHz bus)	£79
• I/O Podule (Analogue/User)	£49
• MEMC 1A Upgrade	£29
• MIDI add-on to I/O Podule	£27
• MIDI Expansion Card	£65
• Econet Network Board	£42
• Archimedes IEEE Interface Adaptor	£269
• Dual RS232 Podule	£195
• 16 bit parallel I/O Card	£195
• Archi replacement mouse – New design	£32
• PC Emulator v1.7	£85
• Software Developers Toolbox	£149
• Floating Point Unit	£455
• SCSI Adaptor Expansion Card	£156
• Keyboard Extension Lead	£6
• 2 Podule Backplane	£20
• 4 Podule Backplane	£25
• Fan for above backplanes	£8
• Risc Os Extras Software Disc	£5
• Ethernet Card	£220
• SCSI Card 8 bit	£129
• A5000 – 2 to 4Mb RAM Upgrade	£92

A3000 Accessories

• 3.5" External Drive	**£95**	• Monitor Stand	£15
• Technical Manual	**£39**	• Serial Upgrade	£17
• A3000 Dust Cover	**£5**		
• A3000 plus Monitor Dust Cover			£9
• A3000 User Port/Midi Upgrade Card			£44
• A3000 User/Analogue/IIC I/O Card			£42
• A3000 External Podule Case			£13

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Archimedes Hard Disc

Watford's ST506 Hard disc drives for A310 & A410 series fit internally into the space provided.
P.S. A310 upgrades require a backplane and a fan.

• **3HDP** – Hard Disc Podule only	£99
• **3HD20** – 20Meg H' Disc + Podule for 310	£195
• **3HD40** – 40Meg H' Disc + Podule for 310	£285
• **3HD50** – 53Meg H' Disc + Podule for 310	£359
• **4HD20** – 20Meg Hard Disc for 410	£69
• **4HD40** – 40Meg Hard Disc for 410	£195
• **4HD50** – 53Meg Hard Disc for 410	£260
• A3000 20Meg Hard Disc + Podule	£279
• A3000 40Meg Hard Disc + Podule	£379

For Low Cost, High Performance Archimedes IDE Hard Disc Drives, please turn to page 13

Archimedes A3000 Desk Top Publishing (DTP) Sale Offer

A3000 BBC Archimedes Micro with 3.5" Floppy Disc Drive and a mouse, upgraded to 2Mb RAM, COLOUR Monitor + Lead, 20Mb fast IDE Hard Disc Drive, 'Compression' Utility to increase the Hard Drive capacity to Typically 40Mb, The highly acclaimed Computer Concept's Impression Junior DTP software package.

RRP: £1299

Sale Offer Price: £875

Above Package plus Acorn's Learning Curve **£892**

NEW DTP Package as above but with a 30Mb fast IDE Drive, (with Compression utility, the capacity is increased to typically 60Mb) **£899**

Above package with Acorn's Learning Curve **£942**

Special Education discounts available on above package, micros, RAM upgrades, ARM 3 Turbo Card, etc. Please write in or telephone:

(0923) 237774/250335

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

• **R300**-4 Layer RAM upgrade board (Bare). Requires 8 x 4MBit RAMs	£25
• **R302**-A3000 – to 2MB RAM Upgrade	£36
• **R303**-A3000 – to 2MB RAM Upgrade (expandable to 4MB)	£55
• **R304**-A3000 – to 4MB RAM Upgrade	£125
• **R311**-A305 – to 1MB RAM Upgrade	£30
• **R312**-A305/310 – to 2MB RAM Upgrade	£149
• **R314**-A305/310 – to 4MB RAM Upgrade	£205
• **R412**-A410/1 – to 2MB RAM Upgrade	£30
• **R413**-A420/1 – to 4MB RAM Upgrade	£60
• **R414**-A410/1 – to 4MB RAM Upgrade	£90
• **R810**-A410/1 – to 8MB RAM Upgrade	£579
• **R820**-A420/1 – to 8MB RAM Upgrade	£549
• **R840**-A440/1 – to 8MB RAM Upgrade	£479
• **R814**-R140 – to 8MB RAM Upgrade	£499
• **A5000** – to 2MB additional RAM Upgrade	£92

0% Finance & Special Teachers/Academics' prices Now available on A3000L/C and A5000 L/C Micro Systems

Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

UP10 – to 2MB RAM + 20MB Hard Disc	£159
UP15 – to 2MB RAM + 40MB Hard Disc	£245
UP20 – to 4MB RAM + 20MB Hard Disc	£225
UP30 – to 4MB RAM + 40MB Hard Disc	£309
UP40 – to 4MB RAM + 53MB Hard Disc	£429

Graphics, Art, Design & Games

GRAPHICS

ARCtist	£19
ARCticulate	£19
Atelier	£65
Artisan II	£45
Artisan Gallery	£16
Autosketch II	£65
Craftshop 1 & 2	£28
Euclid 2	£50
Graph Box	£59
Graphbox Professional	£107
HotLink Presenter	£40
Kermit	£46
Mogul	£17
Poster	£79
Pro Artisan	£70
Prime Art	£69
Render Bender 2	£95
Revelation 2	£80
Snippet	£21
Tween	£21

GAMES

Air Supremacy	£14
Apocalypse	£14
Arcade Soccer	£14
Avante Garde Fonts	£23
Boogie Buggy	£14
Break 147	£18
Bug Hunter	£13
Caverns	£13
Chess 3D	£14
Chocks Away 2	£14
Chocks Away Extra	£14
Chopper Force	£22
Conqueror	£15
Cops	£14
Corruption	£18
Crisis	£21
Elite	£33
Enter the Realms	£19
Enthar Seven	£21
E-Type	£14
E-Type Designer	£13
Family Favourites	£13
Fireball 2	£19
Grievous Bodily Arm	£19
Holed Out Designer	£13
Holed Out Golf	£13
Hostages	£14
Ibix the Viking	£13
Inter Dictor 2	£26
Iron Lord	£15
Jiglet	£25
Jigsaw	£27
Lemmings	£20
Masterbreak	£16
Man at Arms	£14
MahJong Patience	£15
Manchester United Europe	£19
Mig 29	£32
Nevryon	£14
Olympics	£14
Pandoras Box	£18
Pipe Mania	£17
Pirate	£16
Power Band	£14
Puncman 1 & 2	£16
Puncman 3 & 4	£16
Pysanki	£14
Quazer	£10
Real McCoy	£22
Real McCoy 2	£23
Redshift	£14
Return to Doom	£16
Repton 3	£14
Saloon Cars	£18
Spitfire Fury	£22
Splice	£25
Sporting Triangles	£24
Star Trader	£14
Superior Golf	£14
Super Pool	£19
Swin	£22
Talisman	£12
The Pawn	£19
Timewatch	£24
Trivial Pursuit	£22
Twin World	£15
U.I.M.	£23
White Magic 2	£15
Wimp Game	£13
Worldscape	£16
XFire	£19

Miscellaneous

Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
BBC DFS Reader	£6
Broadcaster Loader	£65
Compression (CC)	£38
Equasor	£38
FlexiFile	£97
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
JX Archi Colour Printer Driver for Citizen & Star Printers	£15
Magpie 2	£42
Notate	£42
Numerator	£66
Pin Point	£65
Presenter 2	£29
Presenter Story	£145
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Show Page	£127
Speech!	£15
SWIV	£19
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
Turbo Driver BJ10E	£42
WorldScape	£17

Lease Purchase facility now available. Please telephone or write in for details.

Silicon Vision

Gerber Plot	£95	Solids Render	£120
Solid CAD	£120	Solid Tools	£279
Super Plot	£28	Data Vision	£110
Super Dump	£22	Share Holder	£135
Arc PCB Professional			£275
Realtime Solids Modeller			£136

Desk Top Publisher

Acorn's Archi DTP Package	£108
Equasor	£39
Impression 2 DTP Pack	£125
Impression Junior	£69
Impression Business Supplement	£39
Impression II Borders Disc	£19
Expression-PS	£19
Tempest DTP Package	£90

Archi Wordprocessors

Pendown Archi	£48	1st Word Plus – 2	£63
Pendown Outline Fonts	£18	Archie Spell Master	£25
		PD Spellchecker	£40
Wordwise + Disc	£24	Graphic Writer	£19
Image Writer	£25	EasiWord	£18
Interword Disc	£24		

Databases

AlphaBase	£36	Magpie	£40
Flexifile	£79	Multistore v2.01	£176
Knowledge Organiser	£42	Pinpoint	£65

Spreadsheets

Intersheet Disc	£24	Schema	£89
Viewsheet	£45		

Business Graphics

GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

Integrated Packages

- Logistix £79 • Pipedream 4 £149
- Desktop Office – Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio – Wordprocessor, Desktop & Interactive Publishing. Ideal for school environment. £75

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example programs.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

£42

Concept Keyboards

Standard A3 Keyboard with BBC Software	£138
Standard A4 Keyboard with BBC Software	£109
Archi A3 Keyboard	£139
Archi A4 Keyboard	£110

Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

New RISC OS Version also available (please specify)

For A3000	£15
For A5000	£16

Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.

- A300/A3000 £21 • A400 £25

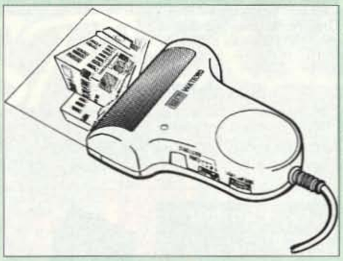
More Archimedes Products See Pages 3, 5, 6, 8, 10, 13

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77			£77 each
Assembler; LISP; Prolog X			£149 each
ANSI C Rel. 3	£125	Logotron Logo	£45
Macro Assembler	£40	Risc Basic	£120
Robo Logo	£69	Risc FORTH	£110
BASIC Compiler	£77		

NEW

256 Grey-Scale Scanner



Watford proudly introduces its new innovative 256 grey-level hand scanner for the Archimedes range of micros. It offers up to 400 dpi scanning resolution, complete with software.

256 Grey-Scale Scanner is ideal for incorporating pre-drawn logos, artwork, photographs and sketches into desktop publishing documents and other graphics programs. Designed by our own R & D team, it offers the best overall scanning solution for Archimedes micro. Just compare the competition on our price and these outstanding features:

- Full 105mm 400dpi scanning operation in just 3mS per line! (Twice as fast as most scanners.)
- Selectable 256/16 grey levels
- Full scan preview, scale to fit windows
- Complete set of image enhancement tools
- Single width podule
- True brightness and contrast control
- Fast RISC OS printing
- Over 1000 Image processing options; smoothing, enhancement, edge deletion, convolution, etc.
- Full Interface to ChangeFSI

Launch Price £185

ULTIMUM – Archimedes A3000 Podule Racking System

THE ONLY LOGICAL WAY TO EXPAND YOUR A3000 COMPUTER

Price: £149

Minerva's Archimedes Software

EasyWord	£18	Mailshot*	£27
Home Accounts	£35	Reporter*	£27
Time Tabler	£549	School Admin*	£65
System Delta	£59		

System Delta Program Reference Manual £29

** Requires System Delta to operate*

Stand alone Business Accounts Packages

Sales; Purchase; Order Processing and Invoicing; Nominal; Stock management

£79 per module

or Complete Business Package **£325**

ARM 3 Turbo Card MkII

Simply The Best

Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £199. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £18.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Offer Price £169

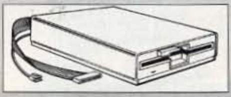
Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

Continued→ → → → → → → → →

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheet, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) **£399**

FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control.

FREE with every BBC Master purchased from us during June

Add-Ons & Accessories

Econet Module for the Master	**£42**
Twin ROM Cartridge for Master	**£9**
Quad ROM Cartridge for Master	**£14**
Master Reference Manual I	(No VAT) **£14**
Master Reference Manual II	(No VAT) **£14**
Master Advance Ref Manual	(No VAT) **£17**
64K Upgrade Kit for B+	**£32**
Acorn 1772 DFS Kit complete	**£49**
ECONET Upgrade Kit for BBC B	**£42**
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	**£238**
Morley Teletext Adaptor with ATS Rom	**£99**
Ecolink	**£270**

Z88 Portable Micro

£179

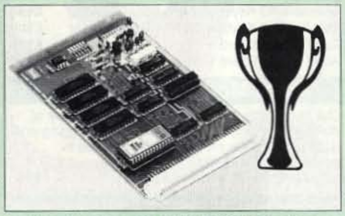
FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

Z88 ACCESSORIES

• 32K RAM Pack or 32K EPROM Pack			**£16**
• 128K RAM Pack or 128K EPROM Pack			**£32**
• 512K RAM Pack			**£86**
• 256K Eprom Pack			**£55**
• Z88 Eprom Eraser Unit			**£38**
• Z88 Carrying Case			**£8**
• Z88 Computing Book			**£9.95**
• AA Nicad Rechargeable Battery			**£1.50**
• Battery Charger Compact & Fast			**£6**
• Z88 Serial Printer Cable			**£8**
• Z88 Parallel Printer Cable			**£18**
• Z88 to Archi Link			**£15**
• Z88 to BBC Link	**£8**	• Z BASE	**£56**
• Z88 to PC Link II	**£27**	• Z TAPE	**£42**
• Z88 to Macintosh	**£32**	• Z TERM	**£42**
• Z88 Mains Adaptor	**£9**	• Z88 Modem	**£114**

Archi Real-Time Digitiser



Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £119

A Set of Colour Filters for colour image grabbing using a video camera **£16**

Archi Graphic Tablet

The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).
(FREE this month, PC Mouse Drivers & Art package)

Special Price £165

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra **£15**

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus **£110**

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

Special Bulk Offer Discs

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£28	£33	£38
• With Sleeves 5.25"	£31	£36	£41
• 3.5" D/S D/D	£27 for 50		£49 for 100

Acorn & Watford DFSs

• Watford sophisticated DFS ROM	**£16.00**
• Watford DFS Kit complete	**£69.00**
• We will exchange your existing ROM for Watford's ultimate DFS ROM at only	**£12.00**
• DFS Manual (comprehensive)	**£6.95**
• Acorn DNFS ROM	**£17.00**
• Acorn ADFS ROM only	**£25.00**
• Acorn 1772 DFS ROM Kit	**£49.00**

(The single Density DFS system is now old technology. Like Acorn, Watford too have replaced it with their more up-to-date 1772 DDFS Interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus the added features as follows:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches.
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.

• Complete Kit	Special Price **£44**
• DDFS Manual	(No VAT) **£6.95**
• We will exchange your existing DFS Kit for our sophisticated DDFS for only	**£26**

3M – Diskettes

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor

• *10 x 5.25" S/S D/D 40T (744)*	***£5***
• *10 x 5.25" D/S D/D 40T (745)*	***£5***
• *10 x 5.25" S/S D/D 80 Track (746)*	***£7***
• *10 x 5.25" D/S D/D 80 Track (747)*	***£7***
• *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT*	***£9***
• *10 x 3.5" S/S D/D 40/80 Track*	***£7***
• *10 x 3.5" D/S D/D 40/80 Track*	***£7***
• *10 x 3.5" Double Sided High Density*	***£13***

Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

● *10 x **M3** 3.5" D/S D/D 80 Track*	***£7***
● *10 x **M9** 3.5" D/S High Density*	***£12***
● *10 x **M4** 5.25" S/S D/D 40 Track*	***£5***
● *10 x **M5** 5.25" D/S D/D 40 Track*	***£5***
● *10 x **M7** 5.25" D/S D/D 80 Track*	***£7***
● *10 x **M8** 5.25" D/S H/D Hi-Density*	***£9***
● ***M2** 3" Double Sided*	***£2.50** each*

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted.

Various UK "manufacturers" of disc drives for the BBC Micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

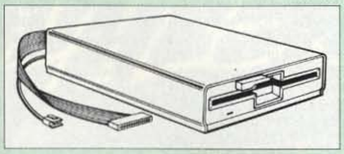
If you look around the popular BBC Micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

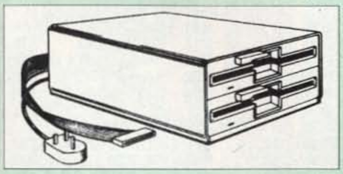
Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. ***Ideal for Schools & Colleges.***

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space. Your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double Plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"





Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
• **CLS400S:**	Single, 40/80 track 400K Double sided Drive	**£70**
• **CLD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£138**
	Disc Drive with PSU	
• **CS400S:**	Single, 40/80 track, 400K Double sided Drive	**£80**
• **CD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£149**

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

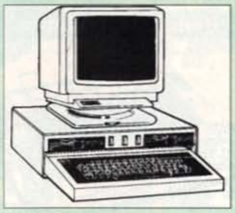
3.5" Disc Drive

These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
• **CLS35:**	Single Disc Drive, 400K	**£59**
• **CLD35:**	Twin Disc Drives, 800K	**£109**
	Disc Drive with PSU	
• **CS35:**	Single Disc Drive, 400K	**£82**
• **CD35:**	Twin Disc Drives, 800K	**£126**

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



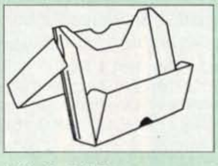
• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£154

Plastic Library Cases



DLC1 –	Holds 5 x 3.5" Discs.	**£1.50**
DLC2 –	Holds 10 x 3.5" Discs.	**£1.90**
DLC3 –	Holds 5 x 5.25" Discs.	**£1.60**
DLC4 –	Holds 10 x 5.25" Discs.	**£2.00**

Disc Albums

Attractively finished in leather-look PVC Vinyl

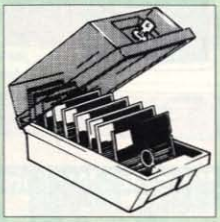
DW1 –	Holds 6 x 3.5" Discs	**£2.50**
DW2 –	Holds 6 x 5.25" Discs	**£3.00**
DW3 –	Holds 20 x 5.25" Discs	**£3.50**
DW4 –	Holds 40 x 3.5" Discs or 5.25" Discs	**£4.50**

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Antistatic Lockable Disc Storage Units



Gives double protection – Strong plastic case that affords real protection to your discs.

Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.

Dividers and adhesive title strips are supplied for efficient filing of discs.

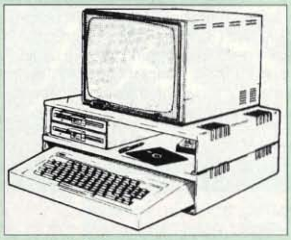
• **M35**	– holds up to 50 5.25" discs	**£4.95**
• **M85**	– holds up to 95 5.25" discs	**£6.95**
• **M25***	– holds up to 25 3.5" discs	**£4.95**
• **M50**	– holds 50 3.5" discs	**£6.50**
• **M100**	– holds 100 3.5" discs	**£6.99**
• **M10**	– holds 8 of No. 10 Data Cartridges	**£15**

* Not lockable

Dust Covers (For our Disc Drives)

Single CLS (without PSU)	**£3.20**
Single CS (with PSU)	**£3.25**
Twin CLD (without PSU)	**£3.85**
Twin CD (with PSU)	**£3.90**

Plinths for the BBC B, BBC Master & A3000



Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

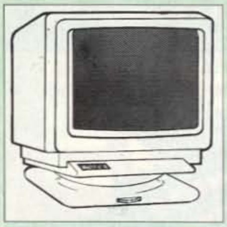
• Single BBC Plinth	420 x 310 x 105mm	**£13**
• Double BBC Plinth	420 x 310 x 210mm	**£24**
• Single Master Plinth	490 x 310 x 105mm	**£14**
• Double Master Plinth	490 x 310 x 210mm	**£26**

• A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive **£14**

VISA

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Continued→ → → → → → → → →



FREE
Connecting lead with every monitor purchased from us. Please specify type required.

Microvitec Monitors

• **1431** – Standard Resolution Monitor	£169
• **1451** – Medium Resolution Monitor	£209
• **Cub3000** Medium Res for A3000	£189
• **1441** – High Resolution Monitor	£359
• Dust Cover for Microvitecs	£5.50
• **Touchtec 501 Touch Screen**	£239

Now 3 years Parts & Labour warranty on all Microvitec Monitors

Multiscan Colour

• Eizo 9060S	£389	• Taxan 770LR	£362
• NEC 3FG	£370	• Taxan 775	£362
• NEC 4FG	£465	• Taxan 795	£397
• NEC 5FG	£850	• Taxan 875	£685
• NEC 6FG	£1525		
• VIDC Enhancer			£25

(P.S. Taxan 795 monitor is supplied with a FREE VIDC enhancer board)

Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexlbility of any 14" colour monitor for the Archimedes micro.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes.

£325

Philips Monitors

• **BM7502** 12" Hi-res Green Monitor	£67
• **CM8833** 14" Med. Res Colour Monitor	£167
• Dust Cover for Philips Monitors	£6

STAR BUY

- **PHILIPS 14"** Medium Res, dark glass, attractively finished Colour Monitor. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £166

Spare Monitor Leads

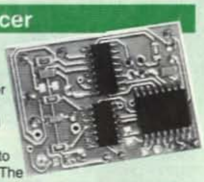
BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

Aries 2000 Colour Monitor

This attractively finished, etched screen medium res monitor is supplied complete with built-in speaker, volume control and video output. All controls are located on the front panel for ease of use. Ideal for BBC, BBC Master, Archimedes and Amiga.

A bargain at £159

VIDC Enhancer



This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control **£45**

MultiVideo VIDC Card: As above but for MultiScan monitors only. **£25**

Panasonic Printers

• KX-P1123	£129	• KX-P1695	£272
• KX-P1124i	£173	• KX-P2624	*£295
• KX-P1170	£100	• KX-P2180C	£165
• KX-P1624	£272	• KX-P2123C	£219
• KX-P1654	*£335		

*** Price includes 12 months On-site warranty**

Cut Sheet Feeders

P36 – 1124/24i	£79	**P37** – 1123/70/80	£69
P38 – P1624/95; P2624			£129

Buffers

P12 4K Buffer Board for KX-P1081	£55
P14 32K Buffer P1123/24/70/80 P1540/92/95; P1624/54/95	£16

Serial Interfaces

P19 for P1123/24/24i/70/80/1624/54/95/2624	£49

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595			£6
P115 for KX-P1180	£7	**P145** for KX-P1124	£7
P140 for KX-P1540	£8	**P155** for KX-P1624	£8
Colour Ribbons for KX-P1081, 1592 & 1595 Brown, Blue or Red			£9 each
P150C Colour for P2123/2180			£15

Citizen Printers

• 120D Plus	£100	• Swift 24E#	£234
• 224	£185	• Swift 24X	£299
• PN-48	£209	• PN48 Ribbon	£4
• Swift 9	£134		

# FREE Colour Option with Swift 24E
+ FREE 2 years Parts and Labour warranty on all Citizen Printers

• Swift 9 Colour Option		£19
• Swift 24 Colour Option		£29
• Swift 24 Ribbons	Black £4	Colour £13
• Citizen/Archimedes Colour Printer Driver		£15

Integrex Colour Jet

• Colour Jet 132 Printer	£449
• Paper Roll	£6.50
• BBC Screen Dump Software	£10
• Colour Cartridge	£21
• Black Cartridge	£12.40
• 100 A4 OHP transparencies	£55
• 8K Serial Interface Optional	£123
• Colour Jet 2000	£POA

Star Printers

• LC15	£173	• SJ48 Inkjet	£174
• LC20	£100	• XB24-200 Colour	£295
• LC24-15	£240	• XB24-250 Colour	£355
• LC24-20	£169	• XB24 Colour kit	£29
• LC24-200	£164	• ZA200 Colour	£234
• LC24-200 Colour	£203	• ZA250	£297
• LC200 Colour	£143		
• Star/Archimedes Colour Printer Driver			£15

Cut Sheet Feeder

LC10/200/24-10	£65	LC15/LC24-15	£125
XB24-10	£80	XB24-15	£139

Serial Interfaces

8K Ser LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15	£52

Buffers

32K Ram Card for LC/XB24-10; 15; LC200	£55

Ribbons

LC10; LC10-II; LC15	Black £4;	Colour £6
LC-200; LC24-200	Black £5;	Colour £12
XB24-10; XB24-15	Black £5;	Colour £12

Laser Printers

All Laser Printers include 12 months On-site maintenance

Brother HL-4	4ppm	£575
Brother HL4-V	4ppm	£675
Brother HL4-PS Postscript	4ppm	£1045
Brother HL8-V	8ppm	£995
Canon LBP4LITE	4ppm	£529
Canon LBP4+ 1.5M RAM	4ppm	£685
Canon LBP-8 III	8ppm	£970
Canon LBP-8III Plus	8ppm	£965
Epson EPL4100	6ppm	£550
Epson EPL7500	6ppm	£1150
Epson EPL8100	10ppm	£965
HP Laserjet IIP+	4ppm	£549
HP Laserjet III	8ppm	£1015
HP Laserjet IIID	8ppm	£1499
HP Laserjet IIIP	4ppm	£705
HP Laserjet IIIsi	16ppm	£2525
NEC Silentwriter S62P P/script	6ppm	£1089
NEC Silentwriter 266	8ppm	£675
NEC Silentwriter 290P P/script	8ppm	£1389
Panasonic KX-P4420	8ppm*	£620
Panasonic KX-P4450i*	11ppm*	£925
Panasonic KX-4455 Postscript	11ppm*	£1450
Panasonic KX-P4430 Satin Print*		£685
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£910
Star LP-8 Star(post)script	8ppm	£1140
Star LP-4	4ppm	£565
Star LP-4 Mk 3	4ppm	£659
Star LP-4PS Postscript	4ppm	£779

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£46	Star LP-8	£56
Epson GQ	£13	KX-P4420/50	£19
EPL 4100	£59	Laserjet HP IIP & IIIP	£42
EPL7100	£82	Laserjet II/D, III/D	£48
EPL7500	£99	Qume Crystal (3)	£58

Laser RAM Upgrades

IIP; III/P 1Mb	£51	EPL7100 256K	£39
IIP; III/P 2Mb	£88	GQ5000 512K	£42
IIP; III/P 4Mb	£135	KX4420/50 1M	£75
II & IID 1Mb	£64	KX4420/50 2M	£115
II & IID 2Mb	£99	KX4420/50 4M	£195
II & IID 4Mb	£146	Star LP8 1M	£139
Canon LBP4 1M	£105	Star LP8 2M	£275
Canon LBP8 2M	£125		

Laser Drum & Developer

• Epson Drum GQ5000	£93	EPL7100	£129
• Panasonic 4420 Drum	£60	Developer	£59
• Panasonic 4450 Drum	£93	Developer	£80
• Qume Drum	£76	Developer	£56

Jetpage Postscript Cartridge

• HP IIP/III	£225	IID & IIID	£227

Various Add-Ons

• Laserjet Appletalk Interface	£135
• HP Adobe Postscript	£399
• Pacific Page Postscript	£259
• HP Premier Font Collection	£28
• Laserjet various Font cartridges	from £45

Hewlett-Packard Printers

# Desk Jet 500	£285	Paintjet XL 300	£1920
Desk Jet 500 Col.	£449	*Quiet Jet Plus	£415
*Paint Jet Colour	£525	*HP Think Jet	£265
*Paintjet XL	£1225		

# 3 years extended Parts & Labour warranty	£49
* Price includes 12 months on-site warranty	
• DeskJet 500 Cart. Black **£15;** Colour	£27
• Paintjet Cartridges Black **£19;** Colour	£23
• Desk Jet 500 256K RAM cartridge	£99
• HP Epson FX Emulation Cartridge for Desk Jet	£59
• DJ 500 High Capacity Black Cartridge	£21

Plug In Font Cartridges for DJ 500

• 22706B – Prestige, Elite, Line Draw fonts	£55
• 22706C Letter Gothic & HP Line Draw fonts	£56
• 22707P – Proprint Emulation Cartridge	£57
• Desk Jet Unlimited (Book No VAT)	£19.75

Canon Bubblejet Printers

	Printer	CSF	D'ble Bin	Ink Cart
BJ10EX	£183	£43	–	£16
BJ20	£265	–	–	–
BJ300*	£289	£88	£65	£12
BJ330*	£380	£110	£79	£12
BJC800C	£1525	–	–	–

• Spare Battery pack for BJ10E	£33
• BJ10EX – Archi Turbo Driver	£42

NEC Pinwriter Printers

• P20	£180	• P70	£419
• P30	£240	• P90	£635
• P60	£325		

• P60/70 Colour Option Kit	£59
• Ribbons Black for P20/30 **£6** for P60/70/90	£7
• Ribbons for P60/70/90 Black **£9** Colour	£13.50

Cut Sheet Feeders

P20 **£59;** P30 **£85;** P60 **£89;** P70/90 **£80**

Epson Printers

DFX5000	£1079	LQ1060 Colour	£595
DFX8000	£1960	LQ1070	£313
FX850	£264	LQ1170	£435
FX1050	£336	LQ2550+	£675
LQ100	£159	LX400	£101
LQ200	£162	LX850+	£140
LQ450	£165	LX1050	£206
LQ570	£205	SQ850	£432
LQ860 Colour	£444	SQ1170	£589
LQ870	£362	SQ2550	£625

Cut Sheet Feeders for

LQ570, LQ870			£47
LX400/850/LQ200/400/450/500/550 LQ1010/1070/1170			£72
LX1050	£115	FX850/LQ860	£128
FX1050/LQ1060/SQ850			£155
LQ2550	£299	SQ2550	£210

Tractor Feed for

LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

Accessories

• EX800/1000 Colour Option	£45
• EX800/1000 Colour Ribbon	£14
• LQ2500 Colour Option	£65
• Multifont Card for LQ550/850/1050	£95

Epson Printer Interfaces

RS232	£28	RS232 + 2K Buffer	£52

Printer Leads

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Nimbus Centronics Lead	£6
IBM/Archimedes Parallel Lead 6'	£4
IBM/Archimedes Parallel Lead 5 metres	£10
IBM/Archimedes Parallel Lead 10 metres	£15
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
MSX Centronics Parallel Lead 4'	£12
RS232 Leads (Various)	P.O.A.
IBM Keyboard extension lead coiled	£5

Fujitsu Printers

B-100	£205	DL1100 Col	£267
B-200	£299	DL1200	£363
DL-900	£181	DL3600	£508
DL1100	£217	VM800	£1036

Ribbons

DL900/1100/1200	Mono	£5	Col.	£11
DL3600	Mono	£6	Col.	£12
B-100/200 Ink Cartridge				£15

Plotters

• HP7440AU	£925	• HP7475AU	£925

Roland Plotters

• DXY1100	£490	• DXY1200	£620
• DXY1300	£825	• DXY2500	£2345
• DXY3500	£2955	• Sketchmate	£310
• Roland plotter Pens, Fibre tip			£7.50

Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
• 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£21
• 1,000 Sheets 15" x 11" Fanfold Paper	£9
• 2,000 Sheets 15" x 11" Fanfold Paper	£16
• 1,000 Sheets true A4 Fanfold Paper 70gms	£11
• 2,000 Sheets true A4 Fanfold Paper 70gms	£21
• Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£6.00
1,000 90 x 36mm (Twin Row)	£6.25
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.75

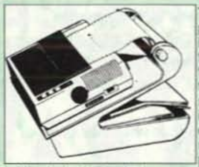
Laser Printer Labels on A4 Sheets

3750 70 x 29mm (3 Rows)	£15.50
3000 70 x 37mm (3 Rows)	£15.25
2625 70 x 42mm (3 Rows)	£15.00

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC Micro	–	£3.50
BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£2.75	£4.50
DMP2000	£2.75	£4.75
DMP4000	£3.75	£4.85
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£4.00	–
LX80/86/800/850	£2.75	£4.50
LX400	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£3.25	£4.75
Panasonic KX-P1124	£7.00	£5.00
Star LC24-10	£2.95	£6.00
Olivetti Ink Jet Cartridges (set of 4)	£6	

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)
132 Column version £29(carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£10	£11
• 3 to 1	£13	£14
• 4 to 1	£16	£17

Professional Type

Connects	Serial	Parallel
• 2 to 1	£17	£18
• 3 to 1	£22	£25
• 5 to 1	£34	£38

Cables extra at £6 each

2 Way Compact Printer Switch

A handy 2 way printer switch can be attached to the micro or monitor for ease of use.

• Centronics **£18;** • Serial **£17**

(Cables extra at £6 each)

Auto Printer Sharer Switch

Connects	Serial	Parallel
2 to 1	£40	£45
4 to 1	£62	£49
8 to 1	–	£89

256k Multi Spooler

These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 2 In/2 out	£135	• 4 In/2 out	£169
• 8 In/1 out	£199		

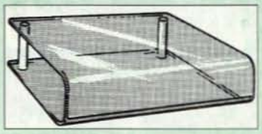
Compact Converter Units

Serial to Parallel	£36	Parallel to Serial	£37

Laser Direct

• Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers	£315
• LPB 4 Printer plus High Res Card	£875
• LPB 8III Printer plus High Res Card	£1275

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	**£16** (carr £3)
136 Column version	**£20** (carr £4)

Continued→ → → → → → → → →

QUEST MOUSE Mk III

• Quest Mouse III & Quest Paint	£59
• Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont	£89
• Quest Mouse III only	£30
• Quest Paint Software only	£34
• Quest Font Disc (22 Text Fonts)	£15
• Quest Mouse Mat (Red or Blue or Green please specify)	£3
• Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer	£18

(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

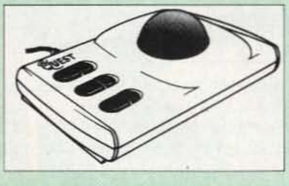
ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

ConQuest ROM Package £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version	**£25**
QT-20 Archimedes Version	**£26**

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose £3

Mk II Light Pen

Ideal for BBC B and Master. Price includes software on disc and operating manual £17

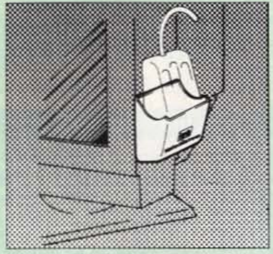
Mk III AMX MOUSE

• AMX Mouse plus Super Art £54

(Please specify for BBC, Master or Compact)

• AMX MOUSE ONLY	£29
• AMX SUPERART Package	£29
• AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£25
• PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
• AMX DESIGN (ROM)	£34
• AMX XAM Educational	£15
• AMX EXTRA EXTRA	£16
• MOUSE MAT	£3

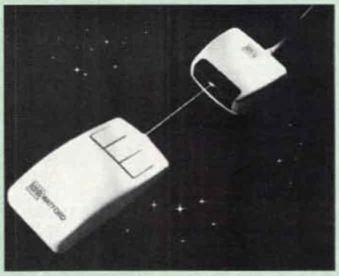
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

Archi Cordless Mouse



Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £59

BEEB VIDEO DIGITISER

"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

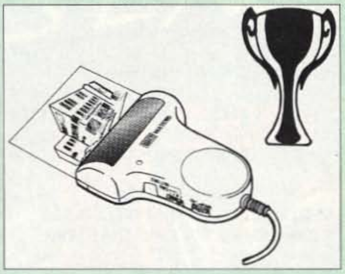
£99

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Beeb Hand Scanner

Hand-held Scanner for the BBC Micro



Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware	£99

Sideways ROM ZIF Socket System

Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- BBC, B and B+ compatible.

£18

ROM Cartridges for the BBC Master

Will also accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£8;** Quad **£13**

User Port Splitter Unit

User Port Splitter
A
B

Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

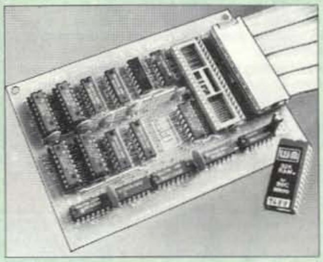
Excellent Value at **£22**

Aries B-488 IEEE-488 Interface Unit

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- While word processing, you don't wait for a slow printer, type in text while printing and save on expensive printer buffers.
- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.
- Use the full 32k or the bottom 12K of the expansion RAM as a printer Buffer. (P.S. Only 12K printer buffer can be used with Wordwise & WW+, due to the way they are written).
- Unique facility to turn ROMs off and on again.

Only £54

(Price includes a comprehensive manual and the ROM)

- **ARIES B-32 Shadow RAM Card** **£55**

Commander Joystick

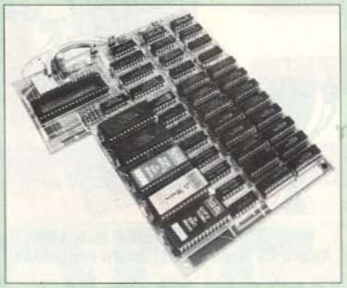
Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

Features:

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15

ROM/RAM Card



- NO SOLDERING required to fit the board.
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM.
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

PRICES:

• ROM/RAM card with 32k DRAM	£42
• ROM/RAM card with 64k DRAM	£54
• ROM/RAM card with a massive 128k DRAM	£89

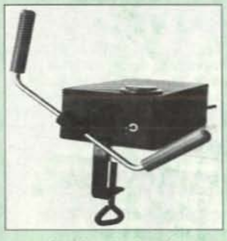
OPTIONAL EXTRAS:

• 16k plug-in Static RAM kit	£8
• 16k DRAM for Upgrade	£13
• Battery backup	£3
• Read and Write protect switches	£2 each
Complete ROM-RAM card with all options fitted	£109

Voltmace Joysticks

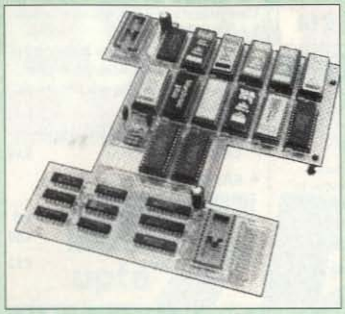
Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24

Delta Base B



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128 £25

Solderless Sideways ROM Socket Board



The key features of this no fuss, easy to install card are:

- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35
Battery Backup fitted **£39**
Battery Backup only **£3**
16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

BBC Educational Software

Maths with a Story 1 (Disc). 4 primary level maths programs	£20.00
Maths with a Story 2 (Disc). 4 further maths programs.	£20.00
Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs.	£17.00
POLYMERS O-Level program.	£20.00
Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule.	£20.00
ADVANCED TELETEXT SYSTEM	£8.65
PERIOD TABLE SOFTWARE	£20.00
Computers at Work – Primary	£17.35
Electric Fields 6-14 years	£11.25
Espana Viva – 3 Discs	£19.95
WHITE KNIGHT Chess game	£16.00
A Vous La France	£29.00
FUN SCHOOL 2 – Red: Under 6 yrs	£12.00
FUN SCHOOL 2 – Green: 6-8 yrs	£12.25
FUN SCHOOL 2 – Blue: 8 yrs+ .	£12.50
FUN SCHOOL 3 – Red	£18.50
FUN SCHOOL 3 – Green	£18.50
FUN SCHOOL 3 – Blue	£18.50
Six French Games – Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+	£26
More French Games – Another 6 games 12 years+	£26
Au Restaurant and Accident de Route 12 years+	£26
Boulogne and Oh-Les – 2 programs for beginners	£26
Letters to French Penpals – 11 years+	£26
French Programs with Henri Beret – The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games. 11-16	£22
Six German Games – Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+	£22
More German Games – Aimed at pupils in their 2nd year of learning German. 12 years+	£22
An Introduction to Electronics – Brings together all the basic electronics required for a GCSE Physics or CDT course. 14-16 years	£26
Computer Control – This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years	£26
PUNCMAN Learning punctuation	
Puncman 1 & 2 for 7 – 13 years	£15
Puncman 3 & 4 for 8 – 14 years	£15
Puncman 5 & 6 for 8 – 15 years	£15
Yes Chancellor – A chance to take over number 11 at Downing Street. 12 years+	£18
Letters & Pictures – Introduces phonic skills to Infants 6-8 years	£15
Numbers & Pictures – Early number learning is a great fun (4-6 years)	£15
Note Invaders – Budding musicians can learn the notes on the Clef with this elegant game 3 programs (7 to Adults) .	£15
Maps & landscapes No. 1 (9-14 years)	£18
Help Your Child learn Basic Map work No. 2 (9-14 years)	£18
Pirate – Educational Adventure (8-14 years)	£15
Spelling Week by Week (6-14 years)	£18

Archimedes Software

Animated Alphabet (3-6 yrs)	£21
Arcventure (8-12 yrs)	£29
Bookbinder	£43
Bumper Disc	£14
Bumper Disc 2	£14
Craftshop 1	£26
Craftshop 2	£26
Converta-Key	£16
Data Word	£16
Desktop Stories	£35
DigiSim	£35
Dream Time (5-7 yrs)	£23
Droom	£19
Farm (5-7 yrs)	£19
Fleet Street Phantom (9-13 yrs)	£25
Fun School 2A Red (up to 6 years)	£12
Fun School 2A Green (6-8 years)	£14
Fun School 2A Blue (8 years +)	£14
Gate Array Teaching System	£68
Glimpse Clip Art Utility (7-16 yrs)	£8
Highlighter (6-16 yrs)	£42
Jiglet	£27
Jigsaw	£28
Mapventure (9-13 yrs)	£24
Microbugs	£24
Money Matters	£16
Nature Park Adventure (7-9 yrs)	£27
Numerator	£60
Picture Book	£16
Recall (6-13 yrs)	£39
Sellardore Tales	£24
Snippet	£26
Space Mission Mada (9-13 yrs)	–
Sting of the Dump (9-13 yrs)	£22
Target Maths	£16
Viewpoints (9-12 yrs)	£33
Wizard's Revenge (7-10 yrs)	£17
Worst Witch (7-10 yrs)	£25

Connecting Leads

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00;** Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	–
6 way Power Connector	120p	150p

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

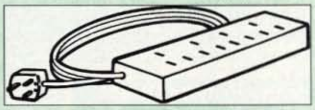
Watford POWER DUCK **£8**

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightening or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets.
Supplied wired up with mains plug ready for use.
Can be screwed to floor or wall if required.
Very useful for tidying up all the mains leads from your peripherals.

£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

28pin DIL Header Plug

SOLDER type **£1.50** IDC CRIMP type **£1.95**

8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only **£1.00**

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28 pin ZIF SOCKET (Textool) **£6.95**

Continued→ → → → → → → → →

Computer Concept's ROMS

Disc Doctor	£18
Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42

Wordwise plus

£40

We are giving away absolutely **FREE,** the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

This advance utilities ROM extends the power of your Wordwise plus ROM.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

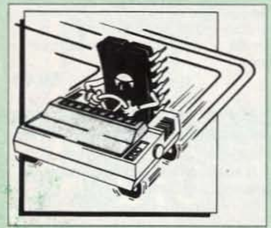
Acorn ROMS

View 3.0 ROM	£45
Viewsheet (Acornsoft)	£36
Viewstore	£36
Viewspell – 80T disc	£25
Viewplot Disc	£20

(Please specify for Master 128 or Compact)

View-Index	£12
Hi-View	£38

View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

Price: Only £29

Mini Office 2 – Disc

for BBC B & B+	£12
for BBC Master	£14
for BBC Compact	£16

(When ordering please specify for which Micro & 40 or 80T Disc)

Assorted ROMS

ACORN ADFS	£25
ACORN BASIC 2 plus User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
Acorn Graphics	£25
Acornsoft C Disc	£36
Acorn LISP	£19
Acorn OS B+	£25
Acorn OS 1.2	£14
Basic Editor	£24
Beebmon	£22
Communicator	£49
Dump Out 3	£25
Graphics Extension Rom	
GXR-B	£21
GXR-B+	£22
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Micro Prolog	£25
Microtext Disc	£46
Microtext Rom	£199
Numerator – Archi	£69
Numerator – BBC	£39
Pendown ROM	£32
Rom Manager	£20
SERIAL ULA	£13
TED	£35
Termulator B, B+	£28
Termulator Master	£32
Video ULA	£14
1Mb OS ROM	£39

CHIP SHOP

1 MB-10 DIL D-RAM	£4.50
1 MB ZIF D-RAM	£4.00
256K x 4-8 DIP	£4.75
256K x 4-8 ZIF	£4.00
SIMs and SIPs	
256 x 9-8	£11
1Mb x 9-10	£26
1Mb x 9-8	£39
DS3691	£4.50
DS88LS120	£5.25
LM324	£0.45
SN76489	£5.50
SAA5050	£8.75
UPD7002	£6.00
2764-250nS	£3.00
27128A-250n (12V5)	£2.50
27128-250nS (21V)	£4.00
27256-2	£3.00
27512-2	£4.50
27C101G (1 Meg)	£7.00
4013	75p
4020	£1.00
4164-10	£1.55
4464-10	£3.50
4816 RAM	£2.00
41256-8	£2.00
41256-10	£1.50
6264LP-8K	£4.00
6502A CPU	£5.00
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£4.00
6522A	£5.00
62256ALS-15	£10.00
62256P-12	£8.50
6818	£4.00
6845SP	£6.00
68B50	£2.95
68B54	£7.50
7438	50p
74LS00	50p
74LS04	50p
74LS10	50p
74LS123	£1.00
74LS163	£1.00
74LS244	£1.00
74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	£1.00
75159	£3.00
8271	£39
9637	£2.00
ICL7673PA	£3.00

Acorn Speech Synthesizer package complete, for the BBC B Microcomputer

Special Offer £14

OFFICE MASTER

CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business.

FINAL ACCOUNTS – Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program.

EASILEDGER – Provides instant management information.

INVOICES & STATEMENTS – Has VAT routines and footer messages facility.

All this for only **£21** (Disc)

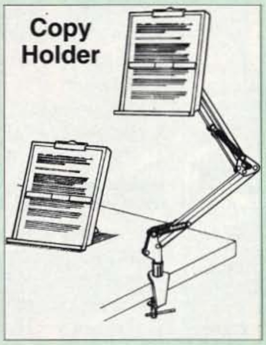
OFFICE MATE

DATABASE – Set up a computerised card index system with powerful search facilities.

SPREADSHEET – Offers many calculation and editing features

BEEBPLOT – Provides visual representation from Spreadsheet data.

Only £10 (Disc)



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip.

Desk Top **£8**
Angle poise **£12**

NEW

Copy holders as above but with a battery operated, remote controlled cursor/ruler. (By hand or foot pedal.) (Batteries 2 x AA not included.)

Desk Top **£15**
Angle poise **£20**

CREDIT CARD
24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs!

The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER EB** – Standard version erases up to 16 chips. £34
- **ERASER GT** – Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. £36
- Spare UV tubes. £12

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip. **£2**

Metal Chip Extractor **£3**

Servisol Foam Cleaner

This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces. **£2.50**

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens. **£2.50**

Aerosol Dust Spray

Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces. **£3**

PC Cleaning Kit

To avoid data corruption and trouble free use of your PCs, it is advisable to clean your PC System once a week. Our Kit 14 is ideal for the purpose.

Kit 14 – 1 each, 3.5" & 5.25" Cleaning Disk, 2 cleaning pads; Drive head cleaning fluid; 20pcs general purpose wipes; Anti-static screen cleaning fluid; General surface cleaning fluid and a transparent plastic case which can hold ten 5.25" Disks when empty. **£10**

Spares for BBC Micro

UHF Modulator	£4
Speaker Grill	£1
Speaker	£3
Keyswitch	£1.50
Master PSU	£59
Master Keyboard	£62
Master Casing	£49
16MHz Crystal	£2
17.734 MHz Xtal	£2
32.768MHz Xtal	£1
BBC B Refurbish Casing	£25
Keyboard	£46
Power Supply	£59
Replacement Flexible 17 way Keyboard Connector	£4

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£6.95
15 Hr Wordprocessing BBC/WW & WW+	£6.95
30 Hour BASIC (BBC Micro)	£12.95
1st Word Plus Rel. 2 Manual	£10.00
A3000 Technical Reference Manual	£29.00
Acorn DTP A Guide to	£17.00
Advanced User Guide for BBC	**£10.95**
Archimedes 1st Step – Beginners Guide	£9.95
Archimedes Assembly Language	£14.95
Archimedes BBC Basic Guide	£20
Archimedes DTP Manual	£10.00
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers Reference Manual	£79.00
Assembly Language Quick Ref.	£21.95
BASIC 2 – User Guide	£2
Basic V – A Dabhand Guide	£9.95
BBC Micro – Within the	£11.95
BBC B Micro User Guide	£15
BCPL User Guide	£9
C Big Red Book of	£8.95
C – A Dabhand Guide to	£14.95
C Programming Lang. 2nd Edition	£24.95
COMAL – Introduction to	£9.50
Deutsch Direkt! (Book only)	£5.95
DISC FILING SYSTEM (DFS) Operating Manual for BBC	£6.95
FORTH on the BBC Micro	£9.95
ISO-PASCAL Reference Manual	£9.95
Master 512 Guide – Dabs Press	£9.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14
Master Reference Manual Part 2	£14
Master Reference Manual – Advanced	£17
MINI OFFICE II – A Dabhand Guide	£9.95
Mouse User Guide to BBC Micro – the Complete	£5.95
Example Programs on Disc for above	£4.95
PASCAL Programming	£10.95
Risc OS Style Guide	£9.95
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'ACORN TO PC' is written clearly and concisely by Dr. John Lockley, who has wide experience of writing and broadcasting. He is currently appearing as a regular contributor on Radio 5, and is co-author of 'The Complete BBC Computer User Handbook'.

Price: £12.95 (No VAT)

The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you. The general style and level of presentation means that both the expert and beginner alike will feel comfortable with the quality and quantity of the material.

Subjects covered include the general use of computers, hardware design and peripheral devices like printers, disc drives, etc, and Networking. Programming hints and tips and various disciplines for making a better program are discussed in some detail, including debugging of specific errors. Standard programs are covered, such as wordprocessors, spreadsheets, databases, graphics, communications, etc., which brings you neatly on to the subject of using computers in the office or at work – even giving advice on writing and marketing your own programs.

A book you will enjoy to use as a reference, or read from cover to cover, over and over.

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The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included.

Price £5.95 (No VAT)

Example programs on Disc £4.95

Beeb PC (BASIC)

Designed for program authors to convert BBC programs to run on IBM PCs.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

Beeb DOS is a collection of utilities which run on the PCs and enable it to read and write information on BBC Discs.

Price: £39

The Epson RX/FX/KAGA Printer Commands Revealed Handbook

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

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Continued→ → → → → →

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Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

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- Supports proposed ANSI ATA (IDE) specification
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- 37 way D type socket for external drives
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£215
ADA 0530	100Mb	16mS	£295
ADA 0570	200Mb	15mS	£479
ADA 0580	330Mb	15mS	£849

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A300/A400/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000	£85

Internal Hard Disc Drives for A3000

State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0700	21Mb	23mS	£185
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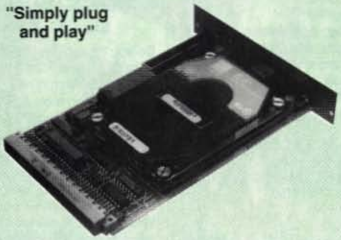
Supplied ready assembled. No soldering required. Simply plug into the alloted space.

Archi IDE Hard Cards

"Simply plug and play"



Watford's NEW low cost, high performance revolutionary IDE Hard Cards for the A300 and A400 series Archimedes are unbelievably easy to install – you simply slot one into any vacant podule backplane slot in the rear of your computer. These stunningly engineered, light weight but fast, 2.5" miniature hard drives are mounted onto the professionally designed cards, and are supplied with the fully Acorn-conformant IDE Filing System ready installed and ready to run. A novel feature of the hard cards is that they can be easily removed and transported to another Archimedes, for example to make a hard disc backup, or to transfer saved files from work to home etc. Security of files on the hard disc is ensured by our unique security password lock, which allows files to be read only, but not overwritten or deleted – ideal for use in school applications where the integrity of your master software needs to be retained.

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(Can be used as a Removable Hard Drive)

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(while stocks last)

100MB Hard Disc Upgrade
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PROBLEM

Mike Cook answers more of your technical posers

On the agenda...
- **Happy mouse board**
- **Colour at a low price?**
- **Easy hard disc-ing**
- **Electron music**
- **Motoring on**
- **Ghostly problems**
- **Incorrect decisions**
- **No chip available**
- **Modem murder**

More mouse joy

HAVING recently read the *More joy for your mouse* Body Building article from the June 1990 issue I decided I would like to build that project but I have a few questions about it:

- Do the symbols ⏚ and ⊤ mean earth and +5v supply?
- Where does the power for the ICs come from? I assume it would be 5v, could it be supplied from a PP3 9v battery?
- Is the project kit available and is the circuit board available separately?

I hope you can help with these questions. – **Adam Stearn, Dunstable.**

- *The two symbols do mean earth and supply. The earth is normally the zero volt line, as it is in this case, but occasionally means the signal earth derived from splitter resistor. This is used when dealing with operational amplifiers. All points marked with this symbol should be joined together.*

The 5 volts required to power the ICs come from the computer itself. There is a 5 volt line on pin 6 of the mouse plug.

Unfortunately all the PCBs of that design have been sold, but an SAE to Musbury Consultants will bring you the artwork for the PCB.

The wrong one

HANDS up everyone who's bought the wrong computer. I was a BBC baby when someone told me about a computer with marvellous graphics capabilities. So I bought an Archimedes to use with my other hobby: Video filming and post-editing work.

What a stupid thing to do. I should have bought a decent machine, or at least one with some support for other uses. Can't the Archimedes do anything except DTP-ing, database-ing or spreadsheet-ing?

Some years have passed since the Archimedes was launched and not one piece of software is on the market to produce scrolling titles using outline fonts – not even PD.

I have one superb package called !SlideShow that does one type of image manipulation. But what about edit controlling of two or more VCRs? Surely software houses must be aware of the popularity of the camcorder, witness the viewing figures for *You've been framed.*

I have a genlock unit and framestore together with PAL coders, all I ask is for some software that uses the full screen – not windows.

So to all those who've still got their hands up, you take your arm down now and put pen to paper and tell the software houses what you want – then we might get it.

The only alternative is to give in and buy a machine that's better supported. – **R. Follett, Winnersh, Berks.**

- *I think you are being a little hard here, software suppliers will not knowingly turn down an opportunity to fill a market. For video titling how about Titler from Clares, reviewed in this issue.*

And I showed how to make an infra-red controller in the June issue. The problem here is that there are so many different types of VCR that any commercial software will have to be complex to handle all types or else tie you into specific hardware – which you'll have to buy in addition to whatever you've got now.

Having said that, it has always been an old maxim that you should see what computer software you want running and then buy the computer that will run it. With the Archimedes able to emulate a PC you get two chances of getting what you need.

One computer can't address all areas of the market at once – if it could there would only be one computer. It may be true that this area of the market has been neglected or considered too small, but as they say, the software is always greener on the computer you haven't got.

Phantom errors on a Master 128

MY Master 128 has been producing a number of odd errors when accessing the disc drive and I can't find any reference to them in the manuals. They are:

```
n
Passed
andand
```

Occasionally there are four empty lines, then the cursor appears. I've even lost a Basic program. – **J. A. Musgrave, Scunthorpe, South Humberside.**

- *These errors you are getting are not actual disc errors but phantom errors, so what's going wrong? When your computer finds something it does not understand or receives an error from the disc controller it sets into action a chain of events.*

One of these is to ask each of the sideways roms whether it knows about the error and whether it wants to do anything about it. This anything can be to handle the error itself, try to recover or pass it on. While this is happening the error message is held in memory so that the roms can alter the message.

It looks like you are experiencing a glitch which is throwing the computer off course and it is recovering via the error reporting system. This is why the error messages don't make any sense, as the message has not been set up in the first place. What you are seeing is simply the rubbish in that memory space.

As these errors happen when you get a disc access I am inclined to think that something is slightly amiss with your hardware. Do you run the drive off the internal power supply? If so, power surges could be causing this. Make sure that you have a terminator fitted in the disc drive.

If you have two drives make sure the terminator is fitted only to the drive at the end of the cable. As the physical appearance of drives can be so varied it is impossible to say where the terminators are. However they should be in some sort of package that can be removed – it's usually the only socketed component on the board.

Finally you could be suffering from a poor mains supply – the drive going on could cause a slight dip in it if your house wiring is not up to scratch. Try running both the drive and computer from another location in the house or another house.

If all that fails it needs looking at with some test equipment, so contact your nearest Acorn service station.

SOLVED

HELP

PROBLEM SOLVED

HELP

PC hard drives

I OWN an Archimedes A310 and a PC 20Mb hard drive – how can I connect the drive to my computer? – **Marc Harris, Coventry.**

● *The simplest thing to do is to sell the PC drive and use the money for an Acorn one. The practical problem is that although the actual hard disc is the same for both machines you need some way of interfacing it with the computer.*

Your drive has interface electronics for the PC, and the Archimedes is very different. As far as I know, no one has produced a PC hardware interface podule. Even if they did, you would then need device driver software to allow you to use the disc.

From the manufacturers' point of view they would have to charge so much for this, coupled with the inevitable problems of trying to cope with many different sorts of PC drives, that it's just not worth it.

Motor mouth

AN old Body Build article in your April 1991 issue has recently caught my attention. It made a reference to the November 1985 issue about interfacing with the LM18293 in order to drive motors – is this chip still available? I have a standard Master 128. – **P. J. Grenyer, Norwich.**

● *The Body Build articles have been going as long as the magazine has, and it is not always possible nor desirable to repeat information. The subject of motor control has been covered many times under different articles and guises but perhaps the definitive articles appeared in July, August and September 1983 issues.*

In general an SAE to Musbury Consultants will bring a kit list and a list of articles. You can obtain a photocopy of any past Body Build article for the nominal cost of £1. However, for only £2 you can get a distillation of these three articles in a Body Build Monograph.

Ask for Monograph No.1 Getting signals into and out of your computer. *The LM18293 is still available at the original price.*

Cheap colour alternative?

I HAVE an Acorn-badged Philips ADF32 medium resolution monitor and when I bought it I was told that for £5 more I could have a composite video input.

At the time I didn't see the need for it but I want it now.

From the look of the circuit board all I might need is a phono socket and two resistors.

Can you give me any help in upgrading the monitor? – **Tariq Kurd, Hoddesden, Herts.**

● *I find it utterly surprising to hear that you could get a composite colour option for only £5 as a great deal of extra circuitry is needed to take the input and convert it to the RGB signals to drive a monitor.*

Composite colour consists of a luminance or brightness signal composed of various proportions of red, green and blue. In addition there are two quadrature-modulated colour difference signals.

Any conversion circuit will have to demodulate these colour difference signals and apply them to a matrix to recover the individual RGB. In addition as we use the PAL (Phase Alternate Line) system there has to be a circuit that produces the analogue delay of a line to ensure the correct decoding. All in all this PAL demodulator normally costs at least £30 to £60.

If there is a modification that requires only a few resistors and a socket, this would be to make up a monochrome composite input socket, which is more likely what was on offer for £5. In any case, get back to the dealer who sold it you and ask him to explain exactly what he meant.

Electron sounds good

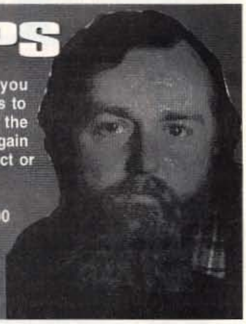
I HAVE an Electron with a Plus 1 and an Advanced Plus 3 connected to a 3.5in disc drive. At the beginning of last year I acquired a Sound Expansion v3 unit from Complex Software Systems which plugs into the Plus 1 – I had to remove my View cartridge to do it though.

I then tried out the Jingle Bells program from the December 1989 issue of *The Micro User* and it worked perfectly. It just goes to show you can have BBC Micro sound on an Electron. – **Paul Matthews, Stroud, Glos.**

● *Thanks for sharing your experience with us. It just goes to show that there is still new life in the old Electron yet. Old computers never die they just fade away – very slowly.*

Before all you Electron owners write in demanding to know where you can get one of these expansions, Complex Computer Systems used to be at Trehaverne House, Kenwyn Road, Truro, but as far as we know they're not trading any more but they might have some old stock if you're very lucky.

MIKE'S TIPS



● If you don't quit Impression correctly you could get a dongle hang-up where it refuses to start up again. You could try shorting out the pins on the disconnected dongle and try again but the safest advice seems to be disconnect or turn off and try again in about three hours.

● If you suspect a fault in your A300/A400 please try to remember the last time you changed the battery. Also check for corrosion on the battery contacts and clean up if necessary.

Find the chip

THE Sound Sampler project has me very interested and I thought I'd like to build it myself. But I'm having great difficulty in finding the ADC 0831, I've been told it's out of production. Is this true? If so, is there some alternative I can use? – **Richard Hill, Derby.**

● *The ADC 0831 has not gone out of production, although a number of retail stockists have dropped it from their list. Unfortunately, as far as I know there's no substitute for this serial output analogue to digital converter. Because of this I have persuaded Musbury Consultants to supply the chip by itself at £6 inc. of VAT and P&P.*

Modem connections

PLEASE help, I've been given a Tandata TM512 DTI modem which I know is in perfect working order as I tried it on a Nimbus PC-186. but it seems the cable is not compatible with my A310.

My local computer centre, who have little experience with Acorn machines, have supplied me with a lead that fits but doesn't work. When I run Hearsay v1.06 and try to connect the modem won't respond in anyway.– **David Bradshaw, Scunthorpe.**

● *It's the lead connections that are wrong. You should connect it up as follows:*

Arc 9 pin	Modem 25 pin
2 RXD	3 RXD
3 TXD	2 TXD
5 0 VOLTS	7 SG
6 DSR	5 CTS
7 RTS	4 RTS
9 RI	8 DCD
1 DCD,4 DTR,8 CTS	20 DTR

The last line shows three pins from the Archimedes wired together and sent to one connector.

It may be possible to make up a cable that works with fewer than the seven wires shown here. This will depend on the combination of hardware and software.

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BODY BUILDING

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Grab a 32-bit of the action

Mike Cook updates his DIY digitiser software for the ARM chip

MOST Body Build projects in the past were based on the older 8-bit processors. When the 32-bit machines came along they could emulate enough of the older machines to allow the projects still to work. However, where the new machines have difficulty is in emulating tight fast machine code.

Several people have written to me to say they have the video digitiser described in the May 87 issue of *The Micro User*, and now they have upgraded to a new computer it will not work. So this month I would like to look at how to drive this digitiser from the ARM chip using an Acorn input/output podule.

Just to recap, the circuit of the digitiser is shown in Figure I. In fact this is a modification over the original design first published, omitting the hard-to-get sync separator chip. It was designed to produce an image that filled a Mode 2 screen with eight shades of grey. This still produces a reasonable picture, but commercial video digitisers for the new machines will give better results.

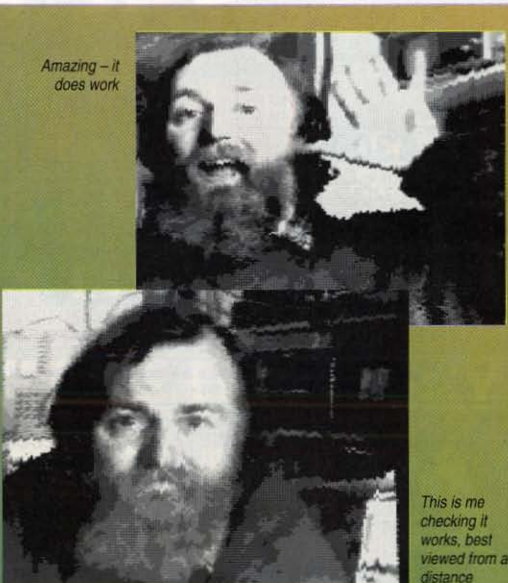
The basic idea is that one sample is taken on every scan line and transferred into the computer. This gives us 64uS between each sample to store it. Other faster designs dump the samples directly into their own memory and later the computer reads the data.

Therefore in this design one column of the image is read in per frame. During the next frame the countdown delay is increased and the next column is read in. This is shown in Figure II. Reading the image this way over several frames produces a low-cost design but requires an unmoving video source.

This is not as big a disadvantage as it may sound, especially if you have a video recorder with a good quality picture hold facility. The column delay is determined by ICs 2 and 4 which loads its value into a programmable counter IC3 and 4. When this times out it triggers a flip-flop and can be sensed by CB2.

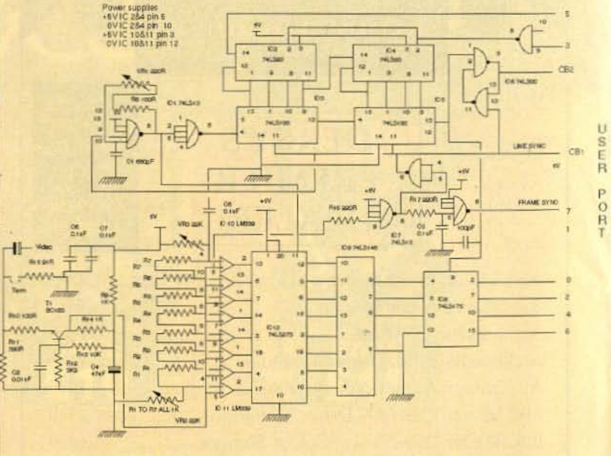
On the video side a flash A/D converter is made from eight voltage comparators and it is latched at the same time that the flip-flop is triggered. Now the assignment of A/D bits and input bits are scrambled to reflect the way a Mode 2 screen was made up on the 8-bit machines.

In this way the relationship between the samples and the screen memory bits was made easy to



Amazing – it does work

This is me checking it works, best viewed from a distance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0V IC 2&4 pin 10
+5V IC 10&11 pin 3
0V IC 10&11 pin 12
IC2 74LS90
IC4 74LS90
IC3 74LS190
IC5 74LS190
IC1 74LS13
IC6 74LS00
IC7 74LS13
IC8 74LS175
IC9 74LS148
IC10 LM339
IC11 LM339
IC12 74LS273
VR1 220R
VR2 22K
VR3 22K
C1 680pF
C6 0.1uF
C7 0.1uF
C8 0.1uF
C9 0.1uF
C4 47uF
100pF
R16 220R
R17 220R
R14 1K
R13 10K
R12 3K9
R1 TO R7 ALL 1K
Video
Term
CB2
CB1
LINE SYNC
FRAME SYNC
USER PORT

Figure I: The full circuit of the digitiser

TAKE IT EASY

If you would like to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User*

handle. The 32-bit machines has a different, simpler arrangement. The first pixel is the lower four bits and the second pixel the upper four. Therefore our software has to descramble these bits before we can put them in the memory – this is done by means of a look-up table.

Finally, in the program we have to be a bit naughty in two respects if we want the frame grab to be as fast as the original. When using the I/O podule system calls access its various locations. However these take time even on the much faster Risc processor. A 32-bit machine accessing input data through the system calls is about 10 times slower than an 8-bit machine addressing the data directly.

Therefore, we need to access the I/O podule directly in memory. This poses a problem, as you can't access these locations unless you are in the supervisor mode, but fortunately we know a way round that. Secondly, we need to write our data directly to the screen so we get an instant idea of how far the scanning process has got. Again if we go through the system calls it will be far too slow to keep up with the speed the data comes in.

Before we look at the program let's see an outline of what needs to be done to grab a picture. One of the best ways is to look at a flow diagram – shown in Figure III. It will also be useful to those of you trying to make a start with ARM code as you can easily relate the function to the instructions.

You will see that a lot of the code is spent in getting the counters and video signal in the right place to start digitising. We need to move in and down from the top corner of the screen to get the best results.

Now let's look at the code. We are going to scan in a picture, transfer it into an internal sprite and then draw the histogram over the top of the image in red. The histogram is a plot of how many of each pixel value we have. To get the best from the video source we have to adjust the camera and the digitiser to spread the values over the available range. The image is held in a sprite so we can save it to disc, without the histogram lines, if we want to keep it.

So first of all we reserve some memory for the sprite, lines 30-40, and then initialise the machine code routine. The rest of the program, lines 60-130, is a simple loop getting a key press and executing the appropriate routine. Note that the digitiser runs in Mode 2 and the text in Mode 0. Each time we change into Mode 2 we have to adjust the palette to give an eight-level grey scale, lines 270-340.

There is a little test, before the machine code is entered, looking at I/O podules using the correct system calls. This looks to see if the line sync

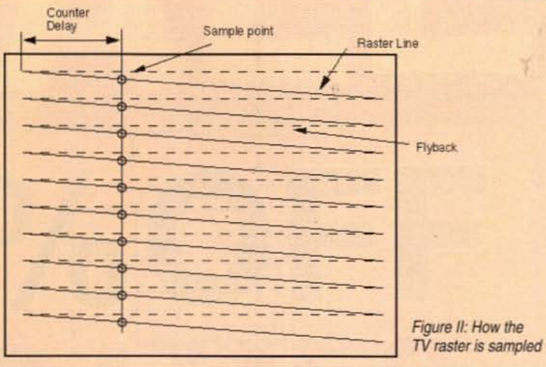

Figure II: How the TV raster is sampled

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```
   10 REM >VIDEO.VDIG1
   20 REM Video Digitiser software By Mi
ke Cook
   30 SS%=&15000
   40 DIM CODE% 330,HS%(7), SP% SS%
   50 PROC_CSU
   60 REPEAT
   70 PROC_TITLE
   80 A$=GET$
   90 IF A$="T" OR A$="t" THEN PROC_TAKE
  100 IF A$="A" OR A$="a" THEN PROC_ADJU
ST
  110 IF A$="V" OR A$="v" THEN PROC_VIEW
  120 IF A$="S" OR A$="s" THEN PROC_SAVE
  130 UNTIL FALSE
  140 END
  150
  160 DEF PROC_TITLE
  170 MODE 0
  180 PRINTTAB(0,5)"Beeb Body Build Cour
se"
  190 PRINT"Video Digitiser Software By
Mike Cook"
  200 PRINTTAB(0,8)"Select options:-"
  210 PRINT"T - Take a Picture - then an
y key to return here"
  220 PRINT"A - Adjust camara - continio
us picture sampling until SPACE pressed"
  230 PRINT"V - View the current sprite
- then any key to return here"
  240 PRINT"S - Save picture as a sprite
 file"
  250 ENDPROC
  260
  270 DEF PROC_PAL
  280 FOR A%=0 TO 7
  290 VDU19,A%,16,A%<<5,A%<<5,A%<<5
  300 NEXT
  310 VDU19,8,16,&F0,0,0
  320 VDU19,9,16,0,0,&F0
  330 VDU 23,1,0|
  340 ENDPROC
  350
  360 DEF PROC_TAKE
  370 MODE 2:PROC_PAL
  380 PROC_SNAP
  390 D$=GET$
  400 ENDPROC
  410
  420 DEF PROC_VIEW
  430 MODE 2:PROC_PAL
  440 SYS("OS_SpriteOp"),28+256,SP%,"PIC
",0
  450 D$=GET$
  460 ENDPROC
  470
  480 DEF PROC_ADJUST
  490 MODE 2:PROC_PAL
  500 REPEAT:PROC_SNAP
  510 UNTIL INKEY(-99)
  520 *FX15,0
  530 ENDPROC
  540
  550 DEF PROC_SAVE
  560 INPUT"Enter file name for sprite "
,F$
  570 SYS("OS_SpriteOp"),12+256,SP%,F$
  580 ENDPROC
  590
  600 DEF PROC_SNAP
  610 SYS 6,150,&60 TO ,,A%
  620 *FX19
  630 SYS 6,150,&6D TO ,,A%
  640 IF A%=0 THEN
  650 VDU 7
  660 PRINTTAB(0,0)"No Video"
  670 ELSE
  680 FOR A%=HIST TO HIST+28 STEP 4
  690 !A%=0
  700 NEXT
  710 CALL SNAP
  720 SYS("OS_SpriteOp"),16+256,SP%,"PIC
",1,0,0,1279,1023
  730 PROC_DHIST
  740 ENDIF
  750 ENDPROC
  760
  770 DEF PROC_DHIST
  780 LOCAL MX%,A%,B%
  790 B%=HIST
  800 FOR A%=0 TO 7
  810 HS%(A%)=!B%
  820 IF HS%(A%)>MX% THEN MX%=HS%(A%)
  830 B%+=4
  840 NEXT
  850 X%=1240
  860 FOR A%=0 TO 7
  870 B%=512*HS%(A%)/MX%
  880 MOVE X%,0:GCOL 0,9
  890 DRAW X%,0:GCOL 0,8
  900 IF HS%(A%)<>0 DRAW X%,B%
  910 X%-=16
  920 NEXT
  930 ENDPROC
  940
  950 DEF PROC_CSU :REM CODE SETUP
  960 SYS(&40500) TO ,PodB%
  970 PodB%=PodB% OR &2000
  980 SYS 6,151,&62,&28 : REM SET UP DAT
A DIRECTION
  990 SYS 6,151,&60,&0  : REM INITAL OUT
PUT
 1000 SYS 6,151,&6C,&10 : REM SET'UP CON
TROL LINES
 1010 SYS 6,151,&6E,&98 : REM ENABLE CON
TROL LINE INTERRUPTS
 1020 FOR A=0 TO 3 STEP 3
 1030 P%=CODE%
 1040 [
 1050 OPT A
 1060 .SNAP
 1070 MOV R0,#&18 \ UNUSED VECTOR NUMBER
 1080 ADR R1,GV \ ROUTINE TO CALL ON UNK
NOWN SWI
 1090 MOV R2,#0 \ NUMBER TO PASS TO CALL
ING ROUTINE
 1100 SWI "OS_Claim" \ CLAME VECTOR
 1110 SWI &80101 \ UNUSED VECTOR TO CALL
 READ IN ROUTINE
 1120 MOV R2,#0
 1130 MOV R0,#&18 \ VECTOR NUMBER
 1140 ADR R1,GV
 1150 SWI &20 \ RELESE VECTOR
 1160 MOV R15,R14 \ BACK TO BASIC
 1170
 1180 .VIA EQUD PodB%
 1190 .TFS EQUD 0
 1200
 1210 .GV \ GATHER VIDEO
 1220 REM TEQP R15,#&C000003 \DISABLE IN
TERRUPTS
 1230 LDR R0,VIA \ VIA BASE ADDRESS
 1240 MOV R7,#&2000000 \ SCREEN ADDRESS
 1250
 1260 MOV R1,#0
 1270 STR R1,[R0] \ RESET COUNTERS
 1280 MOV R1,#&280000
 1290 STR R1,[R0] \ RELEASE RESET
 1300
 1310 \ MOVE COLOUM (X) TO START
 1320 MOV R2,#60
 1330 .PCC
 1340 MOV R1,#&80000
 1350 STR R1,[R0]:MOV R1,#&280000
 1360 STR R1,[R0]:SUBS R2,R2,#1
 1370 BNE PCC
```

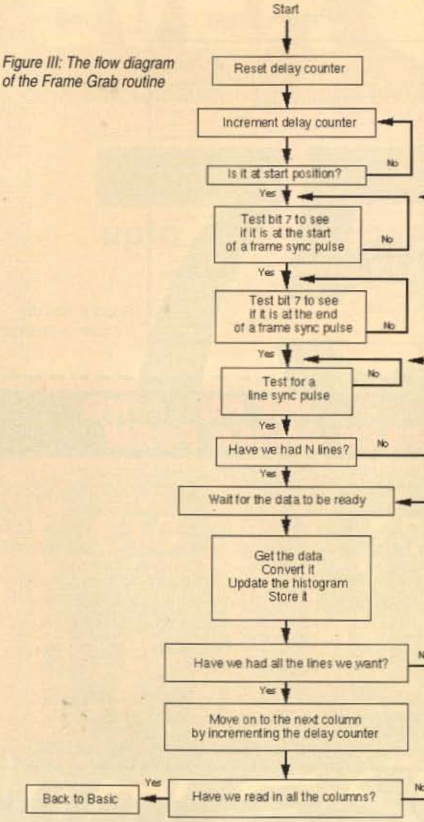
Start
Reset delay counter
Increment delay counter
Is it at start position?
No
Yes
Test bit 7 to see if it is at the start of a frame sync pulse
No
Yes
Test bit 7 to see if it is at the end of a frame sync pulse
No
Yes
Test for a line sync pulse
No
Yes
Have we had N lines?
No
Yes
Wait for the data to be ready
Get the data Convert it Update the histogram Store it
Have we had all the lines we want?
No
Yes
Move on to the next column by incrementing the delay counter
Have we read in all the columns?
No
Yes
Back to Basic

Figure III: The flow diagram of the Frame Grab routine

pulses are present and if not it gives an error message. This is important because if the video is not correctly wired up and no sync pulses are present the computer would hang up in the machine code waiting for one. If this were to happen only a hard reset would regain control.

In PROC_CSU, which sets up the machine code, the I/O podules VIA is initialised using the official system calls.

Also, as the podule can be plugged into any one of the four slots, lines 960-970 return the actual address of the VIA.

One thing to remember when accessing the I/O memory locations on the ARM chip is that when reading data the bits are returned in the lower 16 bits, but data being written has to be put on the top 16. Therefore all outputs have to be shifted by 16 places to the left before storing them in the memory location that corresponds to the VIA.

At the end of the machine code, there is space for the image histogram to be stored, at label HIST, and also lines 1910-2000 poke into memory the de-scrambling look-up table. Finally the last few lines initialise the internal sprite storage.

The lines 1070-1160 contain the trick to get us into the supervisor mode – I have used this before in the sound sampling articles.

From line 1210 the code follows the flow diagram, and I have liberally sprinkled this with comments to help you follow it.

I can supply the software as well as the parts for those of you with 8-bit machines who missed this kit first time around. With the new machines if you have to buy the I/O podule and my digitiser you would not be getting much of a bargain. It would be much cheaper to go for a dedicated digitiser like the HCCS I will be reviewing soon.

But if you already have the digitiser or an I/O podule or want a digitiser you can use on both the old and new machines, this is for you.

```
 1380
 1390 MOV R2,#160 \ NUMBER OF COLOUMBS (
X)
 1400 .HF \ HOLD UNTIL START OF FRAME
 1410 LDRB R1,[R0]:TST R1,#&80
 1420 BNE HF
 1430 MOV R8,#0 \ Y STORAGE ADDRESS
 1440 .HFE \ HOLD UNTIL END OF FRAME PUL
SE
 1450 LDRB R1,[R0]:TST R1,#&80
 1460 BEQ HFE
 1470
 1480 MOV R3,#20
 1490 .HLS  \ HOLD UNTIL N LINES ARE MIS
SED AT THE START
 1500 LDR R1,[R0,#52]
 1510 TST R1,#&10 \ SEE IF A LINE SYNC
 1520 BEQ HLS
 1530 MOV R1,R1,LSL #16
 1540 STR R1,[R0,#52]
 1550 SUBS R3,R3,#1
 1560 BNE HLS
 1570
 1580 \ GATHER IN A COLOUMB
 1590 MOV R6,#256
 1600 .HDT \ HOLD UNTIL DATA IS READY
 1610 LDR R1,[R0,#52]:TST R1,#&8
 1620 BEQ HDT
 1630
 1640 LDRB R4,[R0] \ GET DATA
 1650 AND R4,R4,#&15 \ LEAVE VIDEO DATA
 1660 ADR R1,GLT
 1670 LDRB R4,[R1,R4] \ LOOK UP TABLE
 1680 \ UPDATE HISTORGRAM
 1690 ADR R1,HIST
 1700 LDR R5,[R1,R4,LSL#2]
 1710 ADD R5,R5,#1
 1720 STR R5,[R1,R4,LSL#2]
 1730 \ STORE PIXEL
 1740 ORR R4,R4,R4,LSL #4 \MAKE DOUBLE P
IXEL
 1750 STRB R4,[R7,R8]
 1760 ADD R8,R8,#160 \ INC Y COUNT
 1770
 1780 SUBS R6,R6,#1 \ NEXT LINE
 1790 BNE HDT
 1800
 1810 \ MOVE X COUNTER
 1820 MOV R1,#&80000:STR R1,[R0]
 1830 MOV R1,#&280000:STR R1,[R0]
 1840 ADD R7,R7,#1 \ INC X COUNT
 1850
 1860 SUBS R2,R2,#1 \ ONE LESS X
 1870 BNE HF
 1880 LDMFD R13!, {PC} \ BACK FROM WHENS
T YOU CAME
 1890 .HIST
 1900 ]
 1910 P%=P%+8*4
 1920 [
 1930 .GLT
 1940 ]
 1950 NEXT
 1960 FOR A%=0 TO 7
 1970 READ W%
 1980 GLT?W%=A%
 1990 NEXT
 2000 DATA 0,1,4,5,16,17,20,21
 2010 !SP%=SS%
 2020 SP%!8=16
 2030 SYS("OS_SpriteOp"),9+256,SP%
 2040 ENDPROC
```

Get it right

```
  10 =    0 0   420 = 6DF5 D   830 = ADC9 6  1240 = B659 C  1650 = 1F35 2
  20 =    0 0   430 = 9BDF A   840 = 2C83 E  1250 = D1AD 8  1660 = 1BA7 9
  30 = 8EE8 8   440 = C918 0   850 = 2C3D E  1260 = CDEF D  1670 =  95A C
  40 = 9931 C   450 = CBB7 1   860 = 5221 A  1270 = 53A5 8  1680 =    0 C
  50 = CF41 D   460 = ED0F 9   870 = C4F3 2  1280 = 485D 6  1690 = B8A2 A
  60 = BFBA D   470 = D1AD A   880 = A3FF 3  1290 = 53A5 C  1700 = B63C B
  70 = 29FD B   480 = CA60 B   890 = EFB1 C  1300 = D1AD A  1710 = AE0A 3
  80 = 77F2 E   490 = 9BDF 8   900 = B228 F  1310 =    0 A  1720 = D892 C
  90 = 1272 A   500 = 4984 8   910 = BF38 1  1320 = 95C6 3  1730 =    0 C
 100 = 14F9 2   510 = 4CF5 6   920 = 2C83 9  1330 = EBE2 3  1740 = 6CCB B
 110 = 8C12 2   520 = 6C86 B   930 = ED0F 8  1340 =  1EA 6  1750 = 64ED F
 120 = 97D4 B   530 = ED0F 4   940 = D1AD C  1350 = F168 1  1760 = 7D95 D
 130 = 226C 0   540 = D1AD 1   950 = 59BE 9  1360 = B481 E  1770 = D1AD 1
 140 = FD2E 2   550 = 1C42 0   960 = AA98 8  1370 = 2C3B E  1780 = 58AD 9
 150 = D1AD 0   560 = 12C9 8   970 = 5272 C  1380 = D1AD B  1790 = 3DB8 5
 160 = BF33 B   570 = B790 2   980 = 378F 8  1390 = 9CEE B  1800 = D1AD 7
 170 = 6075 0   580 = ED0F 2   990 = 62CE F  1400 = A210 3  1810 =    0 7
 180 = E0F0 E   590 = D1AD 1  1000 = AB41 2  1410 = 6D5B 4  1820 =  7FC E
 190 = 2EE2 A   600 = E803 A  1010 = AC64 7  1420 = C7E8 3  1830 = 9D31 8
 200 = BB6D 5   610 = C7D8 4  1020 = 46C5 0  1430 = 6BFF B  1840 = B163 A
 210 = FD40 2   620 = 61AE 3  1030 = BFA1 6  1440 = 5515 7  1850 = D1AD 8
 220 = 4392 F   630 = 78B9 9  1040 = EB9E 8  1450 = 6D5B 0  1860 = DEC6 F
 230 = 77D1 1   640 = 5BAC 6  1050 = DDA7 F  1460 = 1734 E  1870 = C7E8 8
 240 = 1BC2 8   650 = CC52 6  1060 = 4B5F 6  1470 = D1AD F  1880 = 9C54 8
 250 = ED0F 0   660 = C7FB 9  1070 = BABE D  1480 = F353 1  1890 = EEE2 3
 260 = D1AD 8   670 = 18C0 B  1080 = C90C 3  1490 = A25A F  1900 = 8B58 8
 270 = AD17 5   680 = 7FF3 1  1090 = 2D51 F  1500 = D84B 1  1910 =  DAE D
 280 = 5221 7   690 = 9261 2  1100 = A867 1  1510 = DC85 9  1920 = EB9E B
 290 = 443A 1   700 = 2C83 7  1110 = 19C4 5  1520 = 8A08 B  1930 = 5FF9 F
 300 = 2C83 B   710 = ADA2 3  1120 = 5633 D  1530 = DD5E E  1940 = 8B58 3
 310 = DF35 3   720 = F023 E  1130 = BABE 6  1540 =  FE4 9  1950 = 2C83 3
 320 = 8626 5   730 = 4B7C 8  1140 = A418 6  1550 = E86B C  1960 = 5221 6
 330 = EC42 8   740 =  8E1 8  1150 = 4061 4  1560 = C4F6 E  1970 = 61B8 1
 340 = ED0F 2   750 = ED0F 1  1160 = F8A9 9  1570 = D1AD D  1980 = FCE8 4
 350 = D1AD 3   760 = D1AD 2  1170 = D1AD 3  1580 =    0 D  1990 = 2C83 6
 360 = 3840 0   770 = DDB2 5  1180 = D7E9 2  1590 = 661D 7  2000 = 1AC0 0
 370 = 9BDF 9   780 = 7D27 D  1190 = 74DB 6  1600 = F7F2 9  2010 = 6803 A
 380 = E674 1   790 = CF6C 5  1200 = D1AD 4  1610 = 6F97 1  2020 = 7385 C
 390 = CBB7 0   800 = 5221 9  1210 = 8D52 4  1620 = 7346 3  2030 = 79EC 5
 400 = ED0F B   810 =  C26 C  1220 =    0 4  1630 = D1AD 8  2040 = ED0F 4
 410 = D1AD D   820 = 3110 F  1230 = 347D 1  1640 = 3217 8
```

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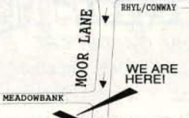

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LET'S COMPUTE!

Rom and Ram

GOTYA ears on, good buddy? Yes, Rom once had a CB radio and now he wants to recreate those excruciatingly painful sounds that accompanied every transmission: Spine shattering high frequency whistles and whines that gave rise to the *squelch* control – although the off control worked 100 per cent better.

Well Ram has come up with quite a few examples of strange sounds this month which you can use in your own programs or games. Still on the subject of sound there's also a drum pattern creator/saver for all you budding Buddy Rich's out there – you haven't heard of Buddy Rich? OK Cozy Powell – so chill out, pump up the volume and any other latter-day mindless garbled glottal garbage.

Channels 0 and 1

Ram has decided to go easy on Rom this month and won't be delving too deeply into what the SOUND command can do on the BBC Micro. The examples in Listing I illustrate the range of sounds achievable using channel 0 in conjunction with channel 1 and some envelopes – see the Cat's Dungeon.

Nor is there any attempt to explain the ENVELOPE command which may be explored in the future. No folks, this is a hands-on user-friendly compendium of usable examples brought to you courtesy of Rom and Ram, Britain's answer to Z Z Top – well, one beard between three.

In it's simplest form sound can be made like this:

```
SOUND P1,P2,P3,P4
        | |  | |
        | |  | duration
        | |  pitch
        | volume
        sound channel
```

P1 can be in the range 0 to 3, P2 can be from 0 to -15, P3 ranges from 0 to 255 and P4 goes from 0 to 255 as well.

For ordinary sounds we use values of 1, 2 or 3 for P1 which are sound channels or voices that produce a reasonably pleasant tone. The volume is varied by P2 with 0 being the quietest and -15 the loudest. P3 varies the pitch or note produced and P4 is the duration or how long you wish a note to be played.

It's possible to synchronise all three voices to produce multi-channel music, a facility about as easy to use as a tin opener on a safe door. Listing II is a drum pattern maker/ player /saver that allows you to set up any beat you wish and save it using a combination of Hi-Hat, Snare and Bass drum.

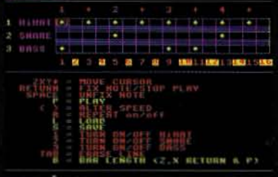
"EAT TO THE BEAT" I KNOW THAT ONE!
ROM JOVI

Because all three *instruments* can sound at once it was not possible to use channel 0 for each which is why the hi-hat sounds like someone defenestrating a budgie, if that's possible or indeed legal.

Anyone who can create a more realistic kit sound please send me the envelopes in exchange for a cartoon.

How it all works

Run the program and lo, there is a grid in the top half of the screen and a list of keys and their uses below that. Initially when the program runs there's a default beat pattern – press P and listen to the beat. A little yellow ^ shape marks out whereabouts in the bar the sounds are coming from.



```
1 HIHAT
2 SNARE
3 BASS

ZX;? = MOVE CURSOR
RETURN = FIX NOTE/STOP PLAY
SPACE = UNFIX NOTE
P = PLAY
< > = ALTER SPEED
R = REPEAT on/off
L = LOAD
S = SAVE
1 = TURN ON/OFF HIHAT
2 = TURN ON/OFF SNARE
3 = TURN ON/OFF BASS
TAB = ERASE LINE
B = BAR LENGTH <Z,X RETURN & P>
```

The Drumkit main working screen where it all hangs out man!

Now press R and where it says REPEAT top left of screen the OFF will change to ON. Now press P and the whole bar will be endlessly repeated – not surprisingly – until you press Return.

You can alter the speed of playback using the < = keys. The speed is displayed as a figure top left – the higher the figure the slower the tempo.

This can done while the beat is playing or not. The red numbers and the + signs are guides to where to place your beats as are the numbers 1 to 16 underneath the grid.

You can turn any of the instruments on or off at at any time so if you want to hear the beat without the strangled budgie press key 1 and the hi-hat will be removed.

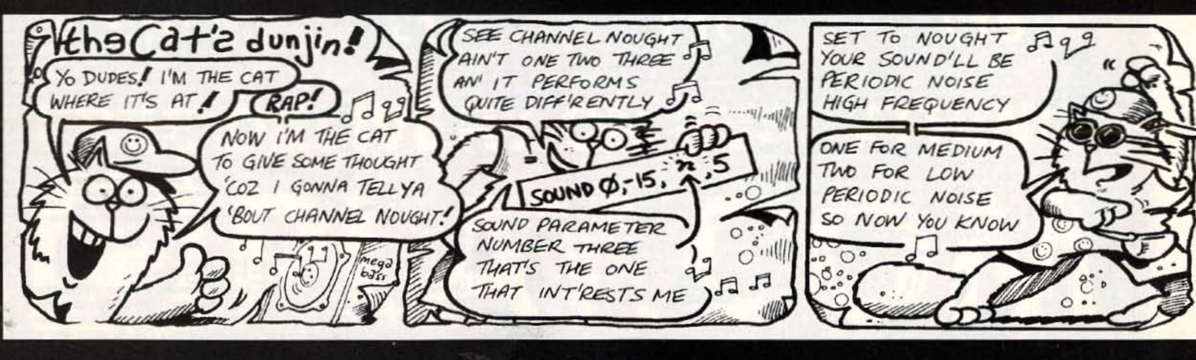
Now try making your own beat. If the current beat is still playing press Return until it stops. See the red cursor? Move it about using Z X ; and ?. When in any of the three instrument rows press Tab and this will erase all placings of notes for that instrument.

Do the same for all three. Now by moving the cursor and pressing Return to fix a note and Space to unfix a note build your own drum pattern.

Press P at any time to hear the cacophony you've created and carry on editing and adding until you're happy with it. Press S to save your pattern and you can call it anything you like (max 7 letters). There are some example beats to load in on the disc, all prefixed *beat* on the monthly disc.

By pressing B and then the Z and X keys you can alter the bar length. The bar length is indicated by the yellow bar that moves left and right within the grid and it says Bar at the top right of the screen during this action. Press Return to fix the bar in place. All that's left now is for you to deploy your foot-tapping and wheel-shunting skills.

```
    5 REM Drumkit
   10 REM by Mike Goldberg
   15 REM (c) The Micro User
   20 ENVELOPE1,1,-1,0,0,2,20,20,126,-2,
-6,-6,126,0
   30 ENVELOPE2,129,50,-90,20,20,20,20,1
26,-6,-12,-12,105,0
   40 REM"R==SNARE SOUND0,-15,4,1
   50 REM" ==HI HAT SOUND2,2,191,1
   60 REM" ==BASS SOUND1,1,2,1
   70 DIMd$(3):d$(1)="HiHAT":d$(2)="SNAR
E":d$(3)="BASS"
   80 DIMw%(3)
   90 DIMS%(16,3)
  100 DIMR$(1)
  110 R$(0)="OFF":R$(1)="ON "
  120 MODE1
  130 VDU23;8202;0;0;0;
  140 VDU19,3,5;0;
  150 PROCscreen
  160 PROCinit
  170 PROCexample
  180 REPEAT
  190 REPEAT
  200 PROCkeys
  210 UNTILINKEY-101
  220 PROCbar
```



the Cat's dunjin!
YO DUDES! I'M THE CAT WHERE IT'S AT!
RAP!
NOW I'M THE CAT TO GIVE SOME THOUGHT 'COZ I GONNA TELLYA 'BOUT CHANNEL NOUGHT!
mega bass
SEE CHANNEL NOUGHT AIN'T ONE TWO THREE AN' IT PERFORMS QUITE DIFF'RENTLY
SOUND Ø,-15, n, 5
SOUND PARAMETER NUMBER THREE THAT'S THE ONE THAT INT'RESTS ME
SET TO NOUGHT YOUR SOUND'LL BE PERIODIC NOISE HIGH FREQUENCY
ONE FOR MEDIUM TWO FOR LOW PERIODIC NOISE SO NOW YOU KNOW

Sounds amazing

Mike Goldberg makes a lot of noise

```
   10 REM Envelopes
   20 REM by Mike Goldberg
   30 REM (c) The Micro User
   40 NS%=12:REM Number of sounds + 3
   50 MODE7:VDU23;8202;0;0;0;
   60 REPEATPROCmenu:UNTIL0
   70 DEFPROCmenu:CLS
   80 FORJ%=1TO2:PRINTTAB(9,J%)CHR$(131+
J%);CHR$141;"ENVELOPES":NEXT
   90 RESTORE:FORI%=4TONS%:PRINTTAB(1,I%
)CHR$(126+(I% MOD7+3));CHR$(I%+61);") ";
:READA$:PRINTA$:NEXT:PRINTTAB(0,23)"Pres
s letter for SOUND"
  100 A=GET:A=A-64:IFA<1ORA>NS%-3GOTO100
  110 *FX15
  120 ON A GOSUB150,180,190,200,210,220,
230,240,160
  130 *FX15
  140 ENDPROC
  150 PROCbass:RETURN
  160 PROCsb:RETURN
  170 END
  180 PROCenv(1,1,-1,0,0,255,0,0,127,-1,
-1,-1,0,0,0,-15,7,50,1,1,1,50,"EXPLOSION
"):RETURN
  190 PROCenv(1,1,4,5,0,255,255,0,127,-1
,-1,-1,0,0,0,-15,3,10,1,1,80,10,"RASP"):
RETURN
  200 PROCenv(1,1,-1,0,0,255,0,0,127,-1,
-1,-1,0,0,0,-15,3,50,1,1,1,50,"MUTANT"):
RETURN
  210 PROCenv(1,3,1,0,0,255,0,0,127,-1,-
1,-1,0,0,0,-15,7,150,1,1,1,150,"TAKE-OFF
"):RETURN
  220 PROCenv(1,1,-1,0,0,6,0,0,127,-1,-1
,-1,0,0,0,-15,7,50,1,1,1,50,"MACHINE GUN
"):RETURN
  230 PROCenv(1,1,-1,0,0,6,0,0,127,-1,-1
,-1,0,0,0,-15,7,250,1,1,5,250,"HELICOPTE
R"):RETURN
  240 PROCenv(1,3,1,-20,1,150,3,50,127,-
1,-1,-1,0,0,0,-15,3,150,1,1,60,150,"MOTO
R-BIKE"):RETURN
  250 REM Print & Sound
  260 DEFPROCenv(A,B,C,D,E,F,G,H,I,J,K,L
,M,N,O,P,Q,R,S,T,U,V,W$)CLS:LOCAL @%
  270 PRINTTAB(0,3)"SOUND = "W$TAB(0,5)"
ENVELOPE "A","B","C","D","E","F","G","H"
,"TAB(10,6)I","J","K","L","M","N
  280 PRINTTAB(3,8)"SOUND"O","P","Q","R;
TAB(3,9)"SOUND"S","T","U","V
  290 ENVELOPEA,B,C,D,E,F,G,H,I,J,K,L,M,
N:SOUNDO,P,Q,R:SOUNDS,T,U,V
  300 PRINTTAB(0,23)"Press SPACE to cont
inue":REPEATUNTILGET=32:CLS:ENDPROC
  310 REM DATA
  320 DATABASS (use keys),EXPLOSION,RASP
,MUTANT,TAKE-OFF,MACHINE GUN,HELICOPTER,
MOTOR-BIKE,SOUND-BARRIER
  330 REM BASS
  340 DEFPROCbass:CLS
  350 PRINTTAB(0,3)"SOUND = BASS"TAB(0,5
)"ENVELOPE Not required"TAB(3,8)"SOUND 0
,-15,3,2"TAB(3,9)"SOUND 1,-1,note,2"TAB(
0,11)"Press keys"TAB(0,12)"Press SPACE t
o stop"
  360 REPEATN=GET:N=((N-64)*4)+100:SOUND
0,-15,3,2:SOUND1,-1,N,2:UNTILN=-28:PRINT
TAB(0,11)SPC30;TAB(0,12)SPC30:ENDPROC
  370 REM SOUND BARRIER
  380 DEFPROCsb:CLS
  390 PRINTTAB(0,3)"SOUND = SOUND-BARRIE
R"TAB(0,5)"ENVELOPE 1,1,-1,-1,0,50,150,5
0,"TAB(10,6)"127,-1,-1,-1,0,0"TAB(0,7)"E
NVELOPE 2,4,0,0,0,0,0,0,"TAB(10,8)"10,-1
,-1,-1,126,126"
  400 PRINTTAB(3,10)"SOUND 1,1,1,200"TAB
(3,11)" SOUND 0,2,7,200"
  410 ENVELOPE2,4,0,0,0,0,0,0,10,-1,-1,-
1,126,126
  420 ENVELOPE1,1,-1,-1,0,50,150,50,127,
-1,-1,-1,0,0
  430 SOUND0,2,7,200:SOUND1,1,1,200
  440 PRINTTAB(1,23)"Press SPACE to cont
inue":REPEATUNTILGET=32
  450 ENDPROC
```

Get it right

```
 10 =    0 0        240 = 8928 4
 20 =    0 0        250 =    0 4
 30 =    0 0        260 =  E33 C
 40 = 69E7 7        270 =  DE1 F
 50 = 8B0B 5        280 = 18E6 2
 60 = 9D69 4        290 = 92F5 2
 70 = 5C12 C        300 = 5125 5
 80 = E754 7        310 =    0 5
 90 = 3845 9        320 = A3B9 4
100 = 5A46 7        330 =    0 4
110 = A022 2        340 = 8096 0
120 = 74BE 5        350 = A754 2
130 = A022 4        360 = 384B 6
140 = ED0F 3        370 =    0 6
150 = F416 3        380 = 2DC8 A
160 = D33E 3        390 = 1468 4
170 = FD2E E        400 = 87ED 1
180 = 7052 5        410 =  E55 7
190 = 82FE C        420 = B17E F
200 = DB92 3        430 = 9301 D
210 = B872 7        440 = 8550 1
220 = 293A 8        450 = ED0F 6
230 = 12D2 C
```

```
  230 UNTIL0
  240 END
  250 REM ==SCREEN
  260 DEFPROCscreen
  270 GCOL0,3
  280 FORI%=772TO792STEP8:MOVE240,I%:PLO
T1,1024,0:MOVE240,I%-64:PLOT1,1024,0:NEX
T
  290 GCOL0,2
  300 MOVE0,1000:PLOT1,1280,0
  310 MOVE0,922:PLOT1,1280,0
  320 MOVE0,576:PLOT1,1280,0:MOVE0,96:PL
OT1,1280,0:GCOL0,3
  330 FORI%=836TO708STEP-64
  340 MOVE240,I%:PLOT1,1024,0
  350 MOVE240,I%-40:PLOT1,1024,0
  360 NEXT
  370 FORI%=240TO1280STEP64
  380 MOVEI%,836:PLOT1,0,-168
  390 NEXT
  400 X%=2:Y%=6
  410 PRINTTAB(X%,Y%)"HiHAT"
  420 PRINTTAB(X%,Y%+2)"SNARE"
  430 PRINTTAB(X%,Y%+4)"BASS"
  440 COLOUR2:FORI%=1TO3:PRINTTAB(0,I%*2
+4);I%:NEXT
  450 g%=16
  460 COLOUR1:PRINTTAB(2,g%-1)"  ZX?* =
MOVE CURSOR"
  470 PRINTTAB(2,g%)"RETURN = FIX NOTE/S
TOP PLAY"
  480 PRINTTAB(2,g%+1)" SPACE = UNFIX NO
TE"
  490 COLOUR2:PRINTTAB(2,g%+2)"     P =
PLAY":COLOUR1
  500 PRINTTAB(2,g%+3)"   < > = ALTER SP
EED"
  510 PRINTTAB(2,g%+4)"     R = REPEAT o
n/off"
  520 COLOUR2:PRINTTAB(2,g%+5)"     L =
LOAD"
  530 PRINTTAB(2,g%+6)"     S = SAVE"
  540 COLOUR1:FORI%=1TO3:PRINTTAB(7,g%+6
+I%);I%;" = TURN ON/OFF ";d$(I%):NEXT
  550 PRINTTAB(2,g%+10)"   TAB = ERASE L
INE"
  560 COLOUR2:PRINTTAB(2,g%+11)"     B =
 BAR LENGTH (Z,X RETURN & P)":COLOUR1
  570 FORI%=1TO4
  580 PRINTTAB(X%-2+I%*8,Y%-2);I%;"   +"
  590 NEXT
  600 X=6
  610 FORI%=1TO16
  620 IFI%MOD2=0COLOUR130:ELSECOLOUR128
  630 PRINTTAB(X+I%*2,12);I%
  640 NEXT
  650 COLOUR128
  660 ENDPROC
  670 REM ==INIT
  680 DEFPROCinit
  690 speed%=170
  700 M%=64
  710 N%=64
  720 R%=0
  730 w%(1)=1:w%(2)=1:w%(3)=1
  740 bar%=16
  750 by%=832
  760 FORI%=1TO16
  770 FORJ%=1TO3
  780 S%(I%,J%)=0
  790 NEXT:NEXT
  800 A$="[]"
  810 B$="*"
  820 VDU5
  830 X%=256
  840 Y%=828
  850 GCOL3,1
  860 MOVEX%-16,Y%:PRINTA$
  870 A%=1
  880 B%=1
  890 REM GOSUB5000
  900 COLOUR3:GOSUB2750
  910 GOSUB2760
  920 GOSUB2690
  930 ENDPROC
  940 REM" ==KEYS
  950 DEFPROCkeys
  960 IFINKEY-103PROCspeed(5)
  970 IFINKEY-104PROCspeed(-5)
  980 IFINKEY-52PROCrep
  990 IFINKEY-98PROCm(-M%,0,-1,0)
 1000 IFINKEY-67PROCm(M%,0,1,0)
 1010 IFINKEY-73PROCm(0,N%,0,-1)
 1020 IFINKEY-105PROCm(0,-N%,0,1)
 1030 IFINKEY-74PROCfix
 1040 IFINKEY-99PROCunfix
 1050 IFINKEY-56PROCplay
 1060 IFINKEY-82PROCsave
 1070 IFINKEY-87PROCload
 1080 IFINKEY-49PROCw(1)
 1090 IFINKEY-50PROCw(2)
 1100 IFINKEY-18PROCw(3)
 1110 IFINKEY-97PROCclear
 1120 FORzz=1TO70:NEXT
 1130 ENDPROC
 1140 REM ==MOVE
 1150 DEFPROCm(x%,y%,a%,b%)
 1160 IFX%+x%<256ORX%+x%>1216ENDPROC
```

FOUR FIVE SIX
HEY! THAT'S "WHITE NOISE"
HIGH MEDIUM LOW
FREQUENCY VOICE
NOW SEVEN AND THREE
WHEN THEY'RE SWITCHED ON
THE PITCH IS VARIED
BY CHANNEL ONE
THREE'S FOR RASPS
AND BASS LINE TWANGS
SEVEN'S FOR HISS
EXPLODING BANGS..
YO! WHAT GIVES...?
WELL THAT'S ENOUGH
YOU'LL ALL AGREE
O'THAT CRAZY CAT
MAKE WAY FOR ME!
AND ME!
AND ME!

Rom and Ram

```
 1170 IFY%+y%<700ORY%+y%>828ENDPROC
 1180 A%=A%+a%:B%=B%+b%:REM"ÑGOSUB5000
 1190 GCOL3,1
 1200 MOVEX%-16,Y%:PRINTA$
 1210 X%=X%+x%:Y%=Y%+y%
 1220 MOVEX%-16,Y%:PRINTA$
 1230 ENDPROC
 1240 REM ==FIX
 1250 DEFPROCfix
 1260 GCOL3,1
 1270 MOVEX%-16,Y%:PRINTA$
 1280 GCOL0,2
 1290 MOVEX%,Y%:PRINTB$
 1300 GCOL3,1
 1310 MOVEX%-16,Y%:PRINTA$
 1320 S%(A%,B%)=1
 1330 ENDPROC
 1340 REM ==UNFIX
 1350 DEFPROCunfix
 1360 GCOL0,0:MOVEX%,Y%:PRINTB$
 1370 GCOL3,1
 1380 MOVEX%-16,Y%:PRINTA$
 1390 GCOL0,0:MOVEX%,Y%:PRINTB$
 1400 GCOL3,1
 1410 MOVEX%-16,Y%:PRINTA$
 1420 S%(A%,B%)=0
 1430 ENDPROC
 1440 REM ==PLAY
 1450 DEFPROCplay
 1460 oldR%=R%
 1470 REPEAT
 1480 e%=256:f%=860
 1490 FORI%=1TObar%
 1500 IFR%=2R%=0:GOTO1630
 1510 GCOL0,2:MOVEe%,f%:PRINT"^"
 1520 IFS%(I%,1)=1ANDw%(1)=1SOUND2,2,191
,1 ELSE SOUND2,0,0,1
 1530 IFS%(I%,2)=1ANDw%(2)=1SOUND0,-15,4
,1 ELSE SOUND0,0,0,1
 1540 IFS%(I%,3)=1ANDw%(3)=1SOUND1,1,2,1
 ELSE SOUND1,0,0,1
 1550 IFINKEY-74R%=2
 1560 IFINKEY-103PROCspeed(5)
 1570 IFINKEY-104PROCspeed(-5)
 1580 IFINKEY-49PROCw(1)
 1590 IFINKEY-50PROCw(2)
 1600 IFINKEY-18PROCw(3)
 1610 FORT=1TOspeed%:NEXT
 1620 GCOL0,0:MOVEe%,f%:PRINT"^":e%=e%+6
4
 1630 NEXT
 1640 UNTILR%=0
 1650 R%=oldR%:GOSUB2760
 1660 ENDPROC
 1670 REM ==SPEED
 1680 DEFPROCspeed(s%)
 1690 speed%=speed%+s%
 1700 GOSUB2750
 1710 FORt=1TO5:NEXT
 1720 ENDPROC
 1730 REM ==REPEAT BAR
 1740 DEFPROCrep
 1750 *FX15
 1760 IFR%=0R%=1:GOSUB2760:ENDPROC
 1770 IFR%=1R%=0:GOSUB2760:ENDPROC
 1780 ENDPROC
 1790 REM ==SAVE
 1800 DEFPROCsave
 1810 *FX15
 1820 VDU4:PRINTTAB(14,1)SPC20:INPUTTAB(
14,1)"SAVE:"f$
 1830 f=OPENOUTf$
 1840 FORI%=1TO16
 1850 FORJ%=1TO3
 1860 PRINT#f,S%(I%,J%)
 1870 NEXT:NEXT
 1880 PRINT#f,bar%
 1890 CLOSE#f
 1900 VDU5
 1910 ENDPROC
 1920 REM ==LOAD
 1930 DEFPROCload
 1940 *FX15
 1950 VDU4:PRINTTAB(14,1)SPC20:INPUTTAB(
14,1)"LOAD:"f$
 1960 GOSUB2690
 1970 f=OPENUPf$
 1980 FORI%=1TO16
 1990 FORJ%=1TO3
 2000 INPUT#f,S%(I%,J%)
 2010 NEXT:NEXT
 2020 INPUT#f,bar%
 2030 CLOSE#f
 2040 PROCdrawit
 2050 ENDPROC
 2060 REM ==DRAWIT
 2070 DEFPROCdrawit
 2080 VDU5:GCOL3,1:MOVEX%-16,Y%:PRINTA$
 2090 VDU4
 2100 FORJ%=6TO10STEP2
 2110 FORI%=8TO38STEP2
 2120 PRINTTAB(I%,J%)" "
 2130 NEXT:NEXT:VDU5
 2140 U%=256:V%=828:GCOL0,2
 2150 FORI%=1TO16
 2160 IFS%(I%,1)=1MOVEU%,V%:PRINTB$
 2170 IFS%(I%,2)=1MOVEU%,V%-N%:PRINTB$
 2180 IFS%(I%,3)=1MOVEU%,V%-(N%*2):PRINT
B$
 2190 U%=U%+M%
 2200 NEXT
 2210 GOSUB2690
 2220 GCOL3,1:MOVEX%-16,Y%:PRINTA$
 2230 ENDPROC
 2240 REM TURN ON/OFF DRUM
 2250 DEFPROCw(w%)
 2260 *FX15
 2270 w%(w%)=(w%(w%)+1)MOD2
 2280 VDU4
 2290 IFw%(w%)=0COLOUR1:PRINTTAB(0,w%*2+
4)"X";" ";d$(w%)
 2300 IFw%(w%)=1COLOUR2:PRINTTAB(0,w%*2+
4);w%;:COLOUR3:PRINT" ";d$(w%)
 2310 VDU5:COLOUR3
 2320 FORr=1TO90:NEXT
 2330 ENDPROC
 2340 REM ==CLEAR
 2350 DEFPROCclear
 2360 GCOL3,1:MOVEX%-16,Y%:PRINTA$
 2370 VDU4
 2380 FORI%=8TO38STEP2:PRINTTAB(I%,B%*2+
4)" ":NEXT
 2390 REMVDU4:PRINTTAB(7,B%*2+4)SPC33
 2400 FORI%=1TO16:S%(I%,B%)=0:NEXT
 2410 VDU5
 2420 GCOL3,1:MOVEX%-16,Y%:PRINTA$
 2430 ENDPROC
 2440 REM ==DATA READ
 2450 DEFPROCexample
 2460 U%=256:V%=828
 2470 GCOL0,2
 2480 READa$,b$,c$
 2490 FORI%=1TO16
 2500 S%(I%,1)=VALMID$(a$,I%,1)
 2510 S%(I%,2)=VALMID$(b$,I%,1)
 2520 S%(I%,3)=VALMID$(c$,I%,1)
 2530 IFS%(I%,1)=1MOVEU%,V%:PRINTB$
 2540 IFS%(I%,2)=1MOVEU%,V%-N%:PRINTB$
 2550 IFS%(I%,3)=1MOVEU%,V%-(N%*2):PRINT
B$
 2560 U%=U%+M%
 2570 NEXT
 2580 ENDPROC
 2590 REM ==BAR LENGTH
 2600 DEFPROCbar
 2610 VDU4:COLOUR2:PRINTTAB(35,1)"BAR"
 2620 REPEAT
 2630 IFINKEY-98ANDbar%>1GOSUB2690:bar%=
bar%-1:GOSUB2690
 2640 IFINKEY-67ANDbar%<16GOSUB2690:bar%
=bar%+1:GOSUB2690
 2650 FORw=1TO90:NEXT
 2660 UNTILINKEY-74ORINKEY-56
 2670 VDU4:COLOUR0:PRINTTAB(35,1)"BAR":V
DU5:COLOUR3
 2680 ENDPROC
 2690 GCOL3,1:MOVEbar%*64+240,by%:PLOT1,
0,-164
 2700 RETURN
 2710 DATA1010101010101010
 2720 DATA0000100000001000
 2730 DATA1000000010100000
 2740 VDU4:PRINTTAB(0,0)"A%=";A%;":B%=";
B%;" ":VDU5:RETURN
 2750 VDU4:PRINTTAB(0,1)"SPEED=";speed%;
" ":VDU5:RETURN
 2760 VDU4:PRINTTAB(0,2)"REPEAT=";R$(R%)
 2770 FORrq=1TO200:NEXT
 2780 VDU5:RETURN
```

TAKE IT EASY

If you would like to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User*

Get it right

```
  10 =    0 0     570 = CFF9 4    1130 = ED0F F    1690 = E3D2 1    2250 = 6887 5
  20 = 357C C     580 = F7E6 9    1140 =    0 F    1700 = 90A4 E    2260 = A022 2
  30 = 5A31 1     590 = 2C83 A    1150 = 77B6 D    1710 = A601 2    2270 = C0C4 0
  40 =    0 1     600 = D233 C    1160 = 1530 B    1720 = ED0F 7    2280 = 765B 1
  50 =    0 1     610 = 78C3 A    1170 = 1F27 3    1730 =    0 7    2290 = A9A1 B
  60 =    0 1     620 = 4BF4 A    1180 = 8575 B    1740 = 589D 5    2300 = FB4D A
  70 = DEAC 8     630 = 1654 2    1190 = 5A7F 2    1750 = A022 B    2310 =  536 4
  80 = 1FA4 B     640 = 2C83 5    1200 = 9310 2    1760 = 4BAB F    2320 = 7C27 9
  90 = 570D 2     650 = A76B 4    1210 = CE0C 1    1770 = E5EB 3    2330 = ED0F 3
 100 = 2491 9     660 = ED0F 4    1220 = 9310 0    1780 = ED0F E    2340 =    0 3
 110 = FAC9 B     670 =    0 4    1230 = ED0F 5    1790 =    0 E    2350 = 4623 7
 120 = EA3A E     680 = 344C 7    1240 =    0 5    1800 = 7A2C F    2360 = 853E A
 130 = F716 F     690 = F5DF 5    1250 =  35B F    1810 = A022 7    2370 = 765B 5
 140 = 805D 8     700 = E509 E    1260 = 5A7F 0    1820 = D460 4    2380 = E4E7 3
 150 = 9538 C     710 =  BDB 5    1270 = 9310 9    1830 = A2C1 9    2390 =    0 3
 160 = DEBB 4     720 = B0FF 6    1280 = 334C C    1840 = 78C3 6    2400 = 86BE 0
 170 = 39DD C     730 = 4B6F 9    1290 = EE33 6    1850 = 71FE 8    2410 = 667A 6
 180 = BFBA 7     740 = FC8A A    1300 = 5A7F 3    1860 = 336F 3    2420 = 853E 7
 190 = BFBA C     750 = CAD8 5    1310 = 9310 9    1870 = 24BD 0    2430 = ED0F 2
 200 = B0B6 A     760 = 78C3 0    1320 = 17D9 5    1880 = EF51 B    2440 =    0 2
 210 = E7A4 1     770 = 71FE 5    1330 = ED0F 5    1890 = A4D0 F    2450 = D47B B
 220 = E1E0 0     780 = 1B0F 4    1340 =    0 5    1900 = 667A 8    2460 = 5F36 E
 230 = 53CE 3     790 = 24BD A    1350 = 1327 5    1910 = ED0F 4    2470 = 334C 1
 240 = FD2E E     800 = 736A 1    1360 =  77A 5    1920 =    0 4    2480 =  B45 B
 250 =    0 E     810 = 7026 4    1370 = 5A7F 6    1930 = 24A1 4    2490 = 78C3 9
 260 = F5B9 C     820 = 667A A    1380 = 9310 E    1940 = A022 B    2500 = A721 4
 270 = 236D B     830 = 446A 4    1390 =  77A 7    1950 = 7ADA 8    2510 = A0F1 A
 280 = 2494 C     840 = BE52 3    1400 = 5A7F 2    1960 = D05C 5    2520 = A241 5
 290 = 334C 1     850 = 5A7F 2    1410 = 9310 4    1970 = FB91 6    2530 = AE4B 7
 300 = A2EE 2     860 = 9310 A    1420 =  7F8 A    1980 = 78C3 8    2540 = 4AC2 E
 310 = 5539 A     870 = 20A5 8    1430 = ED0F B    1990 = 71FE 7    2550 = 4AD9 9
 320 =  812 8     880 = BB79 0    1440 =    0 B    2000 = 6BE2 8    2560 = 314A 0
 330 = F45E 8     890 =    0 0    1450 = EAF8 4    2010 = 24BD 6    2570 = 2C83 1
 340 = 58DC 8     900 = 2307 F    1460 = ADE6 A    2020 = 8BEC 7    2580 = ED0F E
 350 = 3A01 0     910 = 7CF4 E    1470 = BFBA 1    2030 = A4D0 8    2590 =    0 E
 360 = 2C83 8     920 = D05C 0    1480 =  6AA 7    2040 = B298 8    2600 = F778 9
 370 = B80A 4     930 = ED0F 3    1490 = 479A E    2050 = ED0F A    2610 = 85D0 9
 380 = 5C99 3     940 =    0 3    1500 = CE0E 8    2060 =    0 A    2620 = BFBA 3
 390 = 2C83 1     950 = 5A41 E    1510 =  E3C 9    2070 = D219 7    2630 = AA9B 7
 400 = 8523 A     960 = 7ECF C    1520 = 3051 3    2080 = 51A5 5    2640 = 790B E
 410 = D98F 4     970 = 6073 D    1530 = 37A1 A    2090 = 765B 8    2650 = 3499 8
 420 = 2B28 0     980 = 1E07 F    1540 = 427E 1    2100 = BB5A E    2660 = BBFB F
 430 = F0F3 4     990 = D587 0    1550 = 867A B    2110 = 5274 7    2670 = 671D 8
 440 = B7D6 A    1000 = 43EE 6    1560 = 7ECF 1    2120 = E162 A    2680 = ED0F 3
 450 = 12C6 D    1010 = 88A8 D    1570 = 6073 C    2130 = 5649 A    2690 = 8209 C
 460 = 701C 3    1020 = 1443 B    1580 = E733 C    2140 =  2B7 9    2700 = 6E17 4
 470 = B380 0    1030 =  304 5    1590 = 42E3 C    2150 = 78C3 A    2710 = 65E5 0
 480 =  9CD 7    1040 = CC26 8    1600 = BD56 B    2160 = AE4B A    2720 = E8A7 C
 490 = 91EB D    1050 = 5E5B F    1610 = 7C6D 4    2170 = 4AC2 D    2730 = 3731 F
 500 = 9CF5 D    1060 = 2224 F    1620 = 49FD 7    2180 = 4AD9 A    2740 = 259A C
 510 = CD57 E    1070 = 3FA8 0    1630 = 2C83 0    2190 = 314A B    2750 = 3932 9
 520 = F84C 2    1080 = E733 D    1640 = AED3 C    2200 = 2C83 0    2760 = 21D3 A
 530 = 3A06 B    1090 = 42E3 3    1650 = 1103 A    2210 = D05C 3    2770 = 3E4A E
 540 =  DF6 C    1100 = BD56 F    1660 = ED0F 1    2220 = 853E 6    2780 = FA18 D
 550 = BA08 F    1110 = ABAA E    1670 =    0 1    2230 = ED0F 0
 560 = 91F2 6    1120 = F0DB B    1680 = 599D B    2240 =    0 0
```

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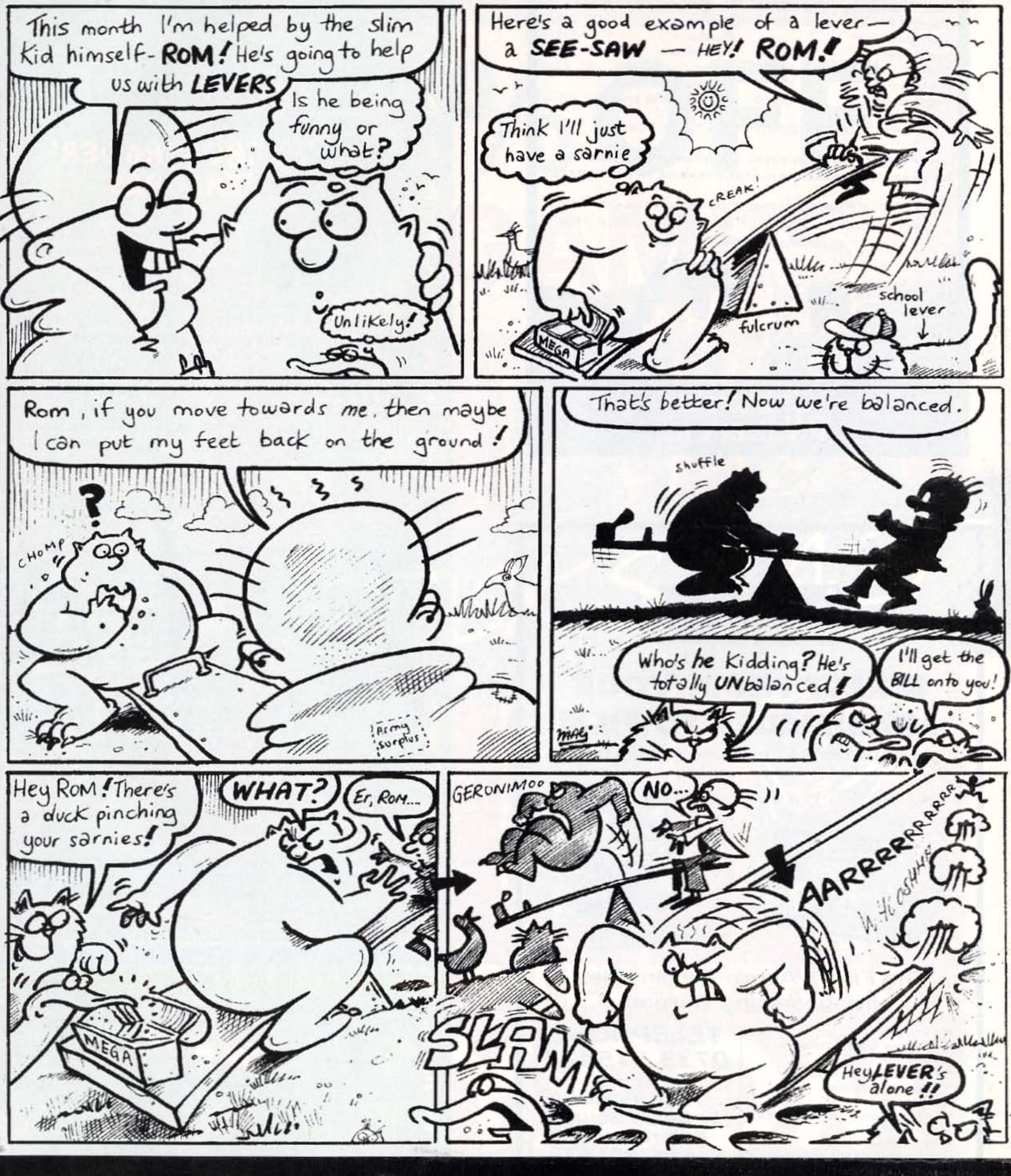
The Safe


This month I'm helped by the slim Kid himself - ROM! He's going to help us with LEVERS
Is he being funny or what?
Unlikely!
Here's a good example of a lever - a SEE-SAW — HEY! ROM!
Think I'll just have a sarnie
CREAK!
fulcrum
school lever
MEGA
Rom, if you move towards me, then maybe I can put my feet back on the ground!
CHOMP
Army surplus
That's better! Now we're balanced.
shuffle
Who's he kidding? He's totally UNbalanced!
I'll get the BILL onto you!
Hey ROM! There's a duck pinching your sarnies!
WHAT?
Er, ROM....
MEGA
GERONIMOO
NO...
AARRRRRRRRRRRR
SLAM
Hey LEVER's alone !!

Scientist

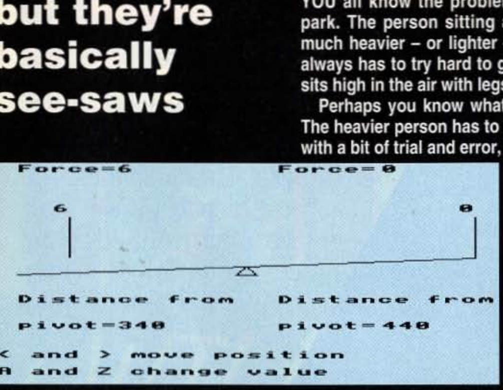
LET'S COMPUTE!

We've got to keep things properly balanced this month because we're looking at levers – but they're basically see-saws

Some leverage

YOU all know the problem with the see-saw in the park. The person sitting at the other end is always much heavier – or lighter – than you are. One of you always has to try hard to get in the air while the other sits high in the air with legs dangling.

Perhaps you know what to do about this problem: The heavier person has to sit nearer to the centre and, with a bit of trial and error, the see-saw will balance.



```
Force=6                 Force=0

  6                                 0

Distance from           Distance from
pivot=340               pivot=440
< and > move position
A and Z change value
```

Trial and error is all very well, but as good scientists we should search for a pattern or a rule. If we could find a see-saw rule, we could know where the heavier person had to sit.

And that's where this month's program comes in. A lever is drawn on screen. It has a load on one side which is not balanced by a second load on the other. Your job is to get it to balance. You can alter the value of the second load and how far it is from the centre.

Type the program in and save it. Then run it and start collecting some data for balanced levers. Instructions are included in the program. Try to find the rule for levers. Once you've found it you'll know what size of load to use and where to put it before you touch the computer.

Enthusiastic programmers might like to improve the graphics. The loads I've created aren't exactly superb and you could also add a sound effect. Perhaps the pitch could rise as you got the lever closer to being balanced.

- *Why not keep your eyes open for useful levers in the coming weeks. You'll find them very common. Next month we'll consider how houses can be kept warm.*

```
   10 REM > LEVER BALANCING
   20 REM THE SAFE SCIENTIST
   30 REM (c) The Micro User
   40 MODE4
   50 VDU19,0,4;0;19,1,3;0;
   60 MOVE640,512:DRAW660,480:DRAW620,48
0:DRAW640,512
   70 MOVE200,480:DRAW1080,544
   80 X=200+RND(40)*10:M=RND(20)
   90 MOVEX,548:DRAWX,700:VDU5:MOVEX-32,
750:PRINT;M:VDU4
  100 VDU5:MOVE200,400:PRINT"Distance fr
om":MOVE200,300:PRINT"pivot=";640-X
  110 MOVE200,900:PRINT"Force=";M
  120 Y=1080:F=0
  130 MOVEY,544:DRAWY,700:VDU5:MOVEY-32,
750:PRINT;F:VDU4
  140 VDU5:MOVE700,900:PRINT"Force=":MOV
E900,900:PRINT;F
  150 VDU5:MOVE700,400:PRINT"Distance fr
om":MOVE700,300:PRINT"pivot=":MOVE900,30
0:PRINT;Y-640:VDU4
  160 Q=Y:R=F:S=1
  170 PRINTTAB(5,26)"< and > move positi
on"TAB(5,28)"A and Z change value"
  180 REPEAT
  190 IF INKEY-1 S=10 ELSE S=1
  200 IF INKEY-103 AND Y>650 Q=Y-S
  210 IF INKEY-104 AND Y<1080 Q=Y+S
  220 IF Q<0 Q=0
  230 IF Q>1080 Q=1080
  240 IF INKEY-66 AND F<20 R=R+1
  250 IF INKEY-98 AND F>0 R=R-1
  260 GCOL0,0:MOVEY,548:DRAWY,700:VDU5:M
OVEY-32,750:PRINT;F:MOVE900,900:PRINT;F:
MOVE900,300:PRINT;Y-640:VDU4
  270 Y=Q:F=R:GCOL0,1:MOVEY,548:DRAWY,70
0:VDU5:MOVEY-32,750:PRINT;F:MOVE900,900:
PRINT;F:MOVE900,300:PRINT;Y-640:VDU4
  280 IF M*(640-X)=F*(Y-640) PROCbalance
  290 IF M*(640-X)>F*(Y-640) PROCleft
  300 IF M*(640-X)<F*(Y-640) PROCright
  310 TIME=0:REPEATUNTILTIME>2
  320 UNTIL0
  330 DEFPROCbalance
  340 VDU7
  350 PRINTTAB(5,26);SPC(21)
  360 GCOL0,0:MOVE200,480:DRAW1080,544:M
OVE1080,480:DRAW200,544
  370 GCOL0,1:MOVE200,512:DRAW1080,512
  380 PRINTTAB(5,28)"BALANCED - PRESS SP
ACE"
  390 REPEATUNTILINKEY-99:RUN
  400 ENDPROC
  410 DEFPROCleft
  420 GCOL0,0:MOVE1080,480:DRAW200,544:M
OVE200,512:DRAW1080,512
  430 GCOL0,1:MOVE200,480:DRAW1080,544
  440 ENDPROC
  450 DEFPROCright
  460 GCOL0,0:MOVE200,480:DRAW1080,544:M
OVE200,512:DRAW1080,512
  470 GCOL0,1:MOVE1080,480:DRAW200,544
  480 ENDPROC
```

Get it right

```
 10 =    0 0     70 = D829 2    130 = CA1C 9    190 = 5BAF 8    250 = 925B 6    310 = 7D45 C    370 = 50B4 9    430 = 328A E
 20 =    0 0     80 = 61B5 1    140 = 5572 C    200 = 8F8B A    260 = DA69 A    320 = 53CE 8    380 = 86C2 3    440 = ED0F 1
 30 =    0 0     90 = C0DC 7    150 = 5B11 5    210 = 8F9A F    270 = 473E 4    330 = B94D 5    390 = 9564 6    450 = E053 B
 40 = BA9F F    100 = C76C B    160 = D46B 1    220 = EC09 E    280 = 1711 3    340 = 4638 C    400 = ED0F 1    460 = EAB0 0
 50 = 51E2 7    110 = B44F 2    170 = 8B1C D    230 =  443 5    290 = 74FC 0    350 = C37B 6    410 = 68C6 7    470 = 7ADF 5
 60 = B5D1 6    120 = B1C4 D    180 = BFBA A    240 = 38A9 D    300 = 282A 1    360 = C0DB 1    420 = B20C 5    480 = ED0F A
```

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SCORE 0
SHEET 1

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Strike
1
Spare
1
Score
10
Play 1
Frame
1
Strike
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Spare
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Score
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Edging out the opposition

Steve Turnbull explores a powerful new tracing utility

Product: Image Outliner
Price: £79
Supplier: Iota Software Ltd.,
St. John's Innovation Centre,
Cowley Road, Cambridge.
Tel: 0223 421542

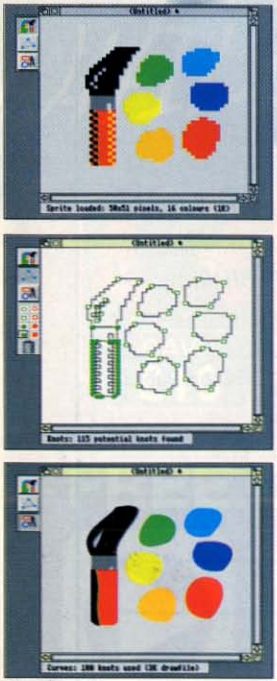
THE ability to convert bit-mapped Sprite images into object-based draw files is fraught with difficulties. Until now the contenders have been Midnight Tracer from Midnight Graphics and Trace from David Pilling. Now there's Image Outliner – part of the recent Image trilogy from Iota.

If you've ever traced a picture you'll remember the frustration of trying to decide where to draw the line between colours.

A piece of software that traces is actually altering the form of the information. In a sprite each pixel is a separate entity with a position and a colour. In a draw file, lines may be straight or curved and form closed paths filled with a particular colour.

The tracer must find the borders between colours and then try to match one or more lines to that border.

Midnight Tracer's main failing was that it couldn't handle straight lines at all, so a rectangle was altered to a strange curved shape. Trace, though low priced, has no facilities for coping with dithered sprite colours.



Sprite loaded: 58x51 pixels, 16 colours (1K)

Knots: 115 potential knots found

Curves: 100 knots used (3K drawfile)

Tracing the high resolution !Paint icon

Image Outliner handles both these problems and is exceptionally easy to use, allowing you to backtrack through each step of the process and edit different features.

The package consists of the disc and 36-page manual in a CD box. The instructions are very clear and well laid out, with an extremely clear description of the difference between sprites and draw files.

The software can be copied on to a hard disc but requests the presence of the original disc when run, unless you have a site licence. Double-clicking the disc icon for Image Outliner runs the application and the icon then appears on the iconbar.

You then select your sprite and drag it on to the iconbar icon. A window appears displaying the sprite with a three-icon toolbox to the left and an information bar below.

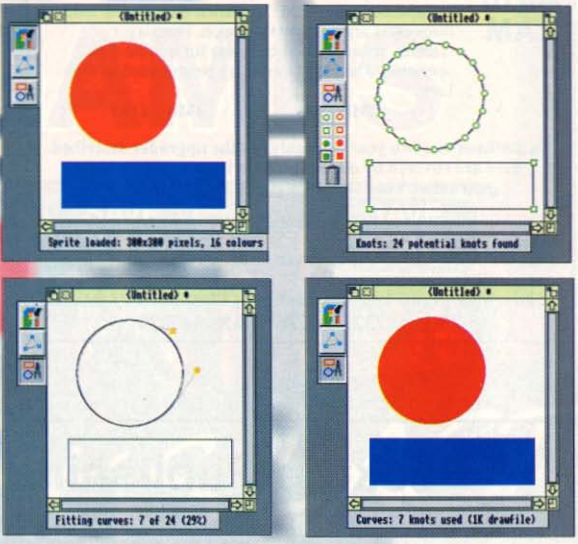
Moving straight along you can click the lowest icon in the toolbox – the one representing a draw file, and this performs the whole conversion process in one go. Plenty of on-screen action allows you to see the program fitting the lines and curves to the colour borders – this feature can be switched off to increase processing speed.

By clicking the sprite tool you can switch back to the original. The sprite itself can be processed to make the tracing more successful.

There are two ways of doing this: First you can clean it, which removes single pixels of one colour surrounded by pixels of another, otherwise the tracer might try to trace around the single pixel.

The second option is to posterise the picture. This involves taking areas of shaded or dithered colour and converting them to a single block of colour. When the posterising window is brought up you can select up to 16 colours and every on-screen shade will be represented by one of the poster colours.

Clicking the middle icon takes you into Knot mode – unique among the tracing programs available. Knots are positions the program calculates as a places where lines should start and end – joining points. There are several different types of knots and in Knot mode you can move, add or remove them or alter their type from potential knots – outline circles or squares – to fixed knots, filled circles or squares.



Sprite loaded: 300x300 pixels, 16 colours

Knots: 24 potential knots found

Fitting curves: 7 of 24 (29%)

Curves: 7 knots used (1K drawfile)

Rectangles and circles provide challenge

A circle knot indicates that the join will be a smooth curve transition from one line to the next while a square will be an abrupt angular change. The total number of knots used affects the final file size – the more used, the larger the file. A Fast option makes the program use every knot which results in less accuracy and large files, but it's quicker.

Clicking on a knot highlights it and allows it to be edited. Alternatively you can use the usual drag methods to highlight whole groups – a menu option helps with knot selection.

When calculating which knots to form the image the program uses a whole set of parameters that can be altered through a dialogue box – although the default settings are quite practical.

Saving the final draw file is a simple drag from the save window.

One very handy feature has been the inclusion of a batch mode. First you drag an unnamed drawfile icon into a directory window which selects the destination. Then a number of sprites can be dragged on to the Image Outliner icon, the names of which are queued and they're processed one by one and saved automatically.

Summing up

While no tracing program can be perfect Image Outliner goes a long way to getting extremely good results. I found no difficulty in using it as it was very intuitive and the options provided make it very versatile indeed. I particularly liked the batch processing option.

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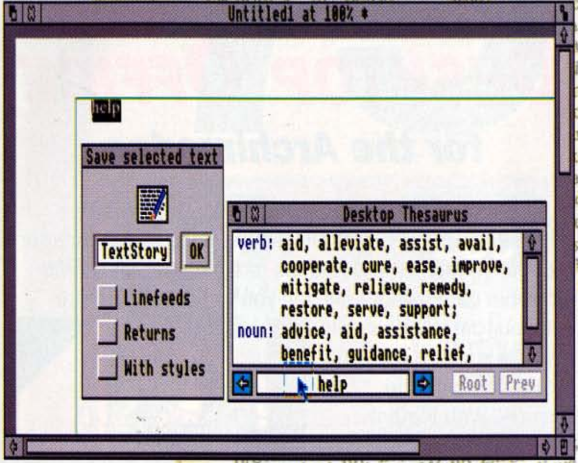
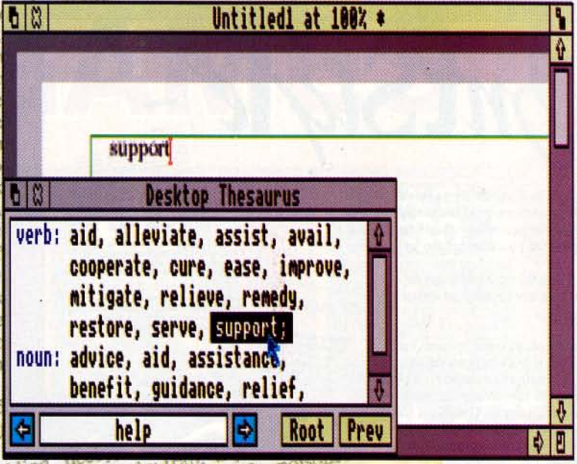
A wealth of meanings

Bruce Goatly looks up a few choice words



verb: aid, alleviate, assist, avail, cooperate, cure, ease, improve, mitigate, relieve, remedy, restore, serve, support;
noun: advice, aid, assistance, benefit, guidance, relief,



verb: aid, alleviate, assist, avail, cooperate, cure, ease, improve, mitigate, relieve, remedy, restore, serve, support;
noun: advice, aid, assistance, benefit, guidance, relief,

Product: Desktop Thesaurus
Price: £22.33
Supplier: Risc Developments, 117 Hatfield Road, St Albans, Herts AL1 4JS.
Tel: 0727 40303
Requirements: Risc OS

IT'S all too easy, sometimes, to be stuck in the middle of writing a sentence, knowing the rough meaning of what you want to write but unable to call to mind the exact word for it.

Because of this fallibility of the mind it's not surprising that one of the most widely used books among writers is a thesaurus which provides you with lists of words of similar meaning – synonyms. All you do is think of a key word near in meaning to the one you can't remember, look it up in an index and scan the appropriate list.

Each list is cross-indexed so you can do more word-association if the first list doesn't get you there. As you can imagine, this involves a lot of page-turning and can take some time.

The obvious answer is to computerise the job, which is exactly what Risc Developments have done with their Desktop Thesaurus. And thanks to the multi-tasking of Risc OS you can extract and replace words interactively with a wordprocessor.

The software comes in a slim card folder containing a 3.5in disc and an eight-page manual. There is no copy-protection, so it can be transferred easily to your hard disc or even to a ram disc if you have about 550k to spare – don't give copies to other people as it is copyrighted.

The application installs its icon on the icon bar as normal and clicking it brings up a window enclosing one large pane. Below this are a writable icon and two other icons labelled Root and Prev.

Typing a key word into the writable icon and then pressing Return initiates access to the compressed data on disc and after a brief delay – about a second for floppy disc but almost imperceptible for hard or ram disc – the pane fills with synonyms.

Each synonym is highlighted as you pass the mouse pointer over it. From this you may guess – correctly – that further searches can be launched by clicking on any of the synonyms.

A non-standard feature is that only a single click is needed and double-clicks cause an extra search to be performed on a word you barely have time to register.

Not that this matters too much, because at any time you can retrace the last 32 steps of your search by clicking on Prev, or start your search again by returning to the Root, the most recent word you typed into the writable icon.

For added inspiration you can browse through alphabetically adjacent key words.

The application can also import key words from any software that has the *Save marked text* facility and then export synonyms back again. The sequence with Impression and Ovation is fast and simple – though again there is a non-standard use of mouse buttons – because inserted text automatically replaces highlighted text.

With Edit you have to delete the marked word before exporting the synonym but this is no hardship as Edit retains the input focus while the thesaurus is searching. You can even export words to PipeDream 3 or Acorn DTP, though you can't import a highlighted word to the thesaurus from them.

One slight irritant that makes the thesaurus a little more awkward to use than necessary is that double-clicking on a word in Impression, Ovation or Edit, to select it for export, also highlights the space following it. This sometimes causes the thesaurus to display synonyms for the word after the one you expect.

The data for the words can be altered fairly easily, making this thesaurus customisable and extensible, even allowing you to develop a French or Spanish thesaurus if you have the skill and the time. Or else you could add new categories such as antonyms – words of opposite meaning – should you be so inclined.

Summing up

This is a neat and easy-to-use implementation of a computerised thesaurus, which greatly enhances the usefulness of wordprocessors and DTP software. Its speed of search is impressive, the import/export facility is a clever extension, and the ability to expand the data rounds it off splendidly. Recommended.

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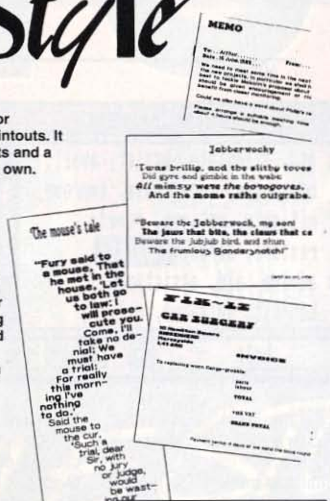
MEMO
Jabberwocky
'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.
"Beware the Jabberwock, my son!
The jaws that bite, the claws that ca
Beware the Jubjub bird, and shun
The frumious Bandersnatch!"
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"Fury said to a mouse, That he met in the house, 'Let us both go to law: I will prosecute you. Come, I'll take no denial; We must have a trial: For really this morning I've nothing to do.' Said the mouse to the cur, 'Such a trial, dear Sir, with no jury or judge, would be wasting our br
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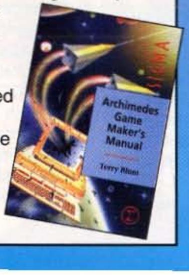
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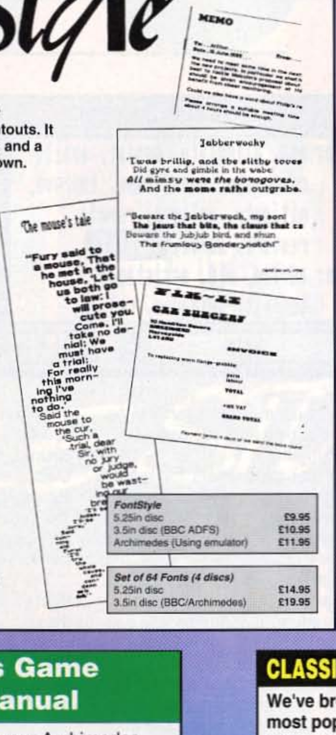

Jabberwocky

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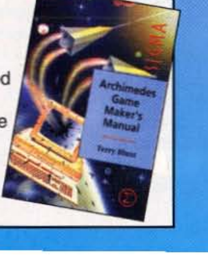

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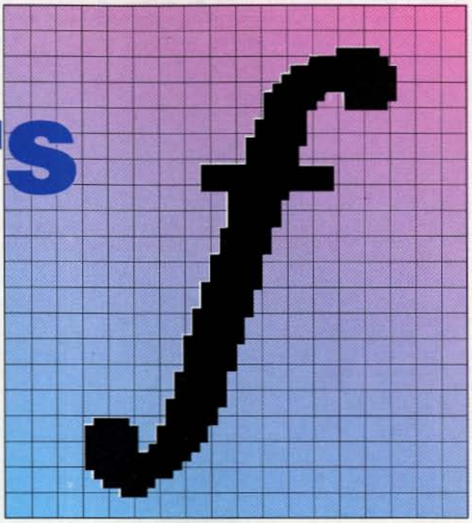
Check up on those characters

Here's a quick method for analysing character definitions, courtesy of Stephen Wade



DEFINING characters on Acorn micros is not a problem – all you need to do is map out the pattern on graph paper, calculate the respective row totals and proceed using *VDU 23*.

But working backwards to determine a bit pattern from a given row total isn't so easy.

The process is tedious, usually involving several calculations, and is prone to error. This can lead to frustration, and the subsequent need for several attempts to work out the complete bit pattern for just one character.

The program here overcomes this problem by prompting for the Ascii code of the character whose bit pattern you require. Once entered – provided the code is that of a valid character – it immediately displays the values on screen.

For the sake of completeness, the decimal and hexadecimal equivalents for each row are also shown, making the identification of the values to be changed – in the VDU 23 statements – straightforward.

How it works

To begin with, the row values of the specified character are read using *osword 10* – read character definition – into a data block named *B%* whose address is pointed to by *X%* and *Y%*.

Next, each value is taken in turn from the block and its bit pattern determined. This is a simple process as it is performed with the logical *AND* command using the numbers stored in line 280.

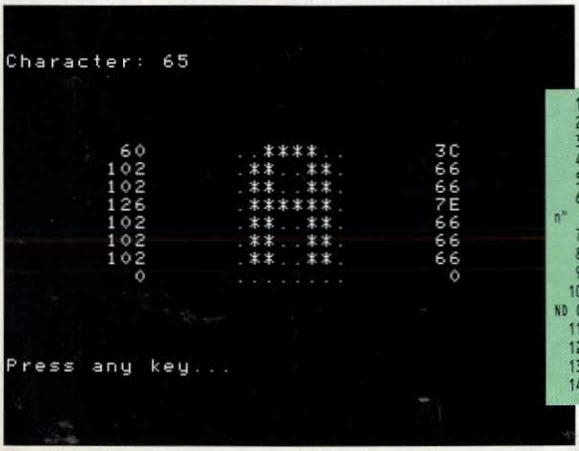
If the bit tested is set, the AND operation is successful and an asterisk is displayed on the screen otherwise a full stop is shown to indicate it is unset. A matrix, which is an enlarged version of the character, is generated.

Program breakdown

Line(s)	Action
40	Change mode, define data block.
50	Begin main loop.
60-80	Display program title.
90	Input character code number.
100	Check that code is valid.
120	Set *A%*, *X%* and *Y%* pointers.
130	Read definition into *B%*.
150-190	Print decimal and hex totals.
200-220	Display bit pattern.
240-250	Wait for a key to be pressed.
260-270	Clear screen and repeat loop.
280	Data values for AND operation.

Get it right

```
 10 =    0 0    150 = 9FF8 3
 20 =    0 0    160 = 7CBB F
 30 =    0 0    170 = 3A97 1
 40 = AB80 0    180 = 4EA2 8
 50 = BFBA B    190 = 9D17 4
 60 = CF12 A    200 = 9C7F F
 70 = E712 2    210 = 1EDC C
 80 = 8186 8    220 = 2C83 D
 90 = 730D 9    230 = 2C83 A
100 = B6D0 B    240 = 6206 A
110 = 7A16 F    250 = 69E5 6
120 = DBC8 2    260 = 7A16 9
130 = B845 1    270 = 91B6 6
140 = E284 A    280 =  90B F
```



```
Character: 65



       60      ..****..      3C
      102      .**..**.      66
      102      .**..**.      66
      126      .******.      7E
      102      .**..**.      66
      102      .**..**.      66
      102      .**..**.      66
        0      ........       0



Press any key...
```

```
   10 REM Display character definition
   20 REM by Stephen Wade
   30 REM (c) The Micro User
   40 MODE 7:DIM B% 8
   50 REPEAT
   60 PRINT "Display Character Definitio
n"
   70 PRINT STRINGS(28,"=")
   80 PRINT:REPEAT
   90 INPUT "Enter Ascii code: "C%
  100 UNTIL C%>31 AND C%<127 OR C%>127 A
ND C%<256
  110 CLS
  120 A%=10:X%=B% MOD 256:Y%=B% DIV 256
  130 B%?0=C%:CALL &FFF1
  140 FOR Z%=1 TO 8
  150 RESTORE
  160 PRINT TAB(0,3)"Character: ";C%
  170 PRINT TAB(0,Z%+7)B%?Z%
  180 PRINT TAB(22,Z%+7)~B%?Z%
  190 PRINT TAB(16,Z%+7);
  200 FOR L%=1 TO 8:READ K%
  210 IF B%?Z% AND K% PRINT "*"; ELSE PR
INT ".";
  220 NEXT
  230 NEXT
  240 PRINT TAB(0,20)"Press any key..."
  250 REPEAT UNTIL GET
  260 CLS
  270 UNTIL 0
  280 DATA 128,64,32,16,8,4,2,1
```

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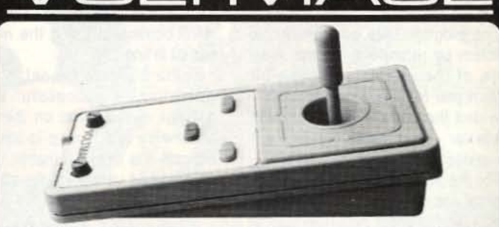

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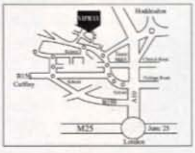

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Electron interfacing

IN YOUR November '91 issue you included an article featuring the use of the Electron for control purposes at the Big Lamp Brewery in Newcastle upon Tyne.

I would like to use my Electron in a similar manner for robotics and need to obtain an Input/Output port. I write to ask if you could advise me where I might acquire such a thing since I have made a number of telephone enquiries but so far have been unsuccessful. – **Graham Barrett, Colchester.**

● We have been unable to trace anyone still selling the interface you want but you may be able to pick up a second-hand one. If anyone out there thinks they can help, write to the Reverend Barrett c/o *The Micro User.*

Lap timing: Z88 user needs help with serial port

HAVING written numerous letters to both Cambridge Computers and M-Tec Computer Services – the writers of the Basic reference manual – with regards to my Z88 portable computer, I am writing to your magazine in the hope that one of your readers may be able to assist me with a project I am currently developing.

Being involved in motorsport, I have written a Basic application that records various chassis and engine settings as well as timing each individual lap of a particular driver.

The lap timing can be performed by key presses on the computer or with the aid of an infra-red light beam across the track which triggers the computer times when the beam is broken. Although I can perform this external trigger on my home computer, an Archimedes is not portable enough for race track use, hence the Z88.

All I am after is a way to sense a change of logic on any of the pins on the serial port.

I presume that all I would require is the memory address as with the Archimedes and I should be able to design the associated electronics to mate up with any ideas that you or your readers may be able to offer. – **Paul Collins, Chipping Sodbury, Bristol.**

● If you have any ideas write to Mr Collins c/o *The Micro User* and we'll forward your letters to him. On the other hand the portable Arc will be here very soon so perhaps that will be a better choice.

Midi problems

I HAVE recently bought the Acorn Midi User Port for my A3000 but I have no idea how to program it for inputting data.

Using Mike Cook's sound sampler kit, I have written a program that inputs sound and draws a graph of that sound on the screen. The program works great on my BBC but it doesn't work on the A3000.

The manual supplied with the Midi port says that you have to use a SYS command which I have no idea how to use. I hope you can put me on the right tracks. – **David Stillman, Barry, South Glamorgan.**

● ***Ian Waugh replies:*** Midi was designed to permit communication between two pieces of musical equipment, something it does using digital messages which are ideal for storage and manipulation by a computer.

We are not sure why you refer to the sampler kit as you can use information recorded from the Midi interface to play Arc samples using programs such as Rhapsody, for example, but that's all. Midi gives you no control over the actual waveforms.

To *input* data through a Midi interface requires a musical instrument such as a keyboard which is also fitted with a Midi interface. The incoming data can be stored, edited and output from the computer via the interface to play the keyboard or another Midi-compatible instrument.

Programs which record and playback data are known as sequencers and they are very sophisticated pieces of software.

If your aim is to write your own sequencer then, unfortunately we can barely begin to scratch the surface of the topic in a reply such as this.

You'll need a good knowledge of the Arc's Basic – although lower level languages are preferable – and know how to handle interrupts. These are used by the interface and are listed in the Appendix of the Midi Interface User Guide.

SYS is a statement for calling operating system routines and the interface supports a wide range of commands which recognise different types of Midi data such as Note On, Note Off, Control Change messages and so on.

Some short programming examples are given on the Midi Guide although I can appreciate they will be of limited help to the beginner. You'll have to acquire some programming books which tell you how to use SYS and take it from there.

However, there are a number of sequencers and music programs for the Archimedes which will save you having to get your hands dirty.

Begin with Maestro which can output information via Midi – a Midi column appears in the Instruments window if you have a Midi interface fitted – then check out Rhapsody or one of the fully fledged sequencing programs such as Inspiration or EMR's Studio 24.

Font-wise

AFTER double-clicking a Fonts application I find it annoying to be told that I have Outline Font Manager 2.42 installed, that I have the following fonts available and so on and that I have to press space or click the mouse to continue.

This information can be suppressed by editing the Run file which lives inside the Fonts application directory.

To do this, first open the Fonts directory by clicking on its icon while

Portable plea from a dedicated Acorn fan

PRIZE letter

WITH the recent sale of my faithful 420/1 I have been left with a glut of programs and files for future use on an A5000.

I have decided to go to University in October and the thought of lugging a desktop computer around the country does not make me smile. I would if buy a portable if Acorn actually had one – yes, I realise that a portable Arc is supposed to be on the way, but by October? I don't think so.

Meanwhile I am left studying the many articles and adverts for PC portables running Windows. And while I read about this and that specification, I begin to wonder whether Acorn will get their new portable right first time.

There have been rumours that the machine will be a laptop. Please Acorn make sure that it's a true notebook – A4 in size and weighing under 6lb. I expect that Risc OS 3 will be standard once they have sorted out the problems, but what will happen to the humble mouse – will it be replaced by a trackerball? It has to be said that making decent keyboards is not really one of Acorn's strong points. So I make a plea now for a really nice keyboard with a good feel and a sensible layout like the ones from Toshiba and Compact. In addition I think one of those 1.6Mb drives would do nicely.

So we come to the display. Most of the portable screens nowadays are pretty good with either 16, 32 or even 64 shades of grey. But they lack control over the mouse pointer.

As the Arc is almost entirely mouse driven, I believe that Acorn must think hard about the solution to this problem.

But what processor should be used? Well the Arm3 chip seems to be the best, especially as it uses so little power. And, on the subject of power, let's have some really good power-saving ideas like slowing down the processor or going into standby mode and so on.

Further suggestions are: Include a 60Mb hard drive as standard, at least 2Mb of ram and don't forget to have a good number of external ports including one for an external monitor, external keyboard and a dedicated mouse and do make sure that the batteries can be recharged quickly and while using the machine.

So finally I say to Acorn, if it means producing a portable which will astound all other computer users, forcing the competition to stand up and say: Wow! Now that's what we should be aiming for! *then do it and quickly but don't leave out any major features.*

Let's have a portable we can be proud of, one we can boast is made by Acorn. – **Tim Riches, Worcester.**

● What can we say? You may be disappointed with some aspects while pleasantly surprised by others. The release is imminent though, so start saving.

holding down the Shift key. Then drag the !Run file into a text editor such as Edit or DeskEdit. The file will look something like this:

```
| !Run file for !Fonts (version
0.11, 10-May-89)
|
Iconsprites <Obey$Dir>.!Sprites
|
RMEnsure FontManager 2.44 RMLoad
<Obey$Dir>.Fonts
RMEnsure SuperSample 0.04 RMLoad
<Obey$Dir>.Super
|
SetMacro Font$Path <Font$Prefix>.
Set Font$Prefix <Obey$Dir>
|
Echo Outline Font Manager 2.42
installed.
Echo Fonts now available:
Echo
FontCat
```

It is the Echo and FontCat commands at the bottom of the file that are responsible for sending the text to the VDU. Simply delete these and resave the file as !Run within the Fonts directory.

Now when you double-click on the Fonts directory, the application will simply run with no messages displayed. – **John Scott Paterson, Byker, Newcastle upon Tyne.**

● Alternatively you can add the line:

```
Desktop
```

to the end of the file, ensuring there's a Return after it, and that will avoid the *Press space or mouse* request.

Z88 sounds off

MOST people jump to the conclusion that you can't play music on the Z88. True the Z88 doesn't have a sound chip but it does have something special. The Z88 prints on a LCD screen and has a small speaker. The ingredients are there to create sound and to hear it without the aid of a sound chip.

It has several sound channels that have been asleep for far too long. This was proved in your February 1988 issue and one of the sound channels is ideal for playing basic music and the others can be used for sound effects.

In order to keep things simple. I've turned the Z88 into a 3.25 octave keyboard, meaning that you have 41 notes to play like a musical instrument.

Duration control has been predetermined by the arrow keys to help with programming and pressing the Shift key and one other gives you access to another sound on the music channel. All in all this means that you have 44 easy accessible sounds on one channel with a maximum of 1,804 musical notes.

Because the Z88 has a small speaker you'll need an amplifier plus a telephone pickup lead to hear your sounds in a noisy environment. – **P. Williams, Bromley, Kent.**

Getting the boot

HOW on earth do you create a hard disc boot file? I have fiddled around for ages using the BOOT and OPT 4 commands. I tried in vain to create my boot file in Edit.

Please could you give me some guidance as the user manual is not very helpful. I am not worried about installing modules and such like, but I really want to have Menon loading on startup using my SCSI drive. – **Ben Howes, Carlton, Beds.**

● It's true that creating a hard disc boot file is not straightforward – unless you are very knowledgeable about the machine. But for everyone who is confused by this the August 1992 issue will feature an article on this very problem.

Oops!

I READ with interest the article in your May issue about Object Oriented Programming.

Do you know of any company planning to release a language with object oriented features for the Archimedes. Languages such as C++ or Object Pascal are available for the IBM PC and this would seem to be a gap in the market. – **David Graham, Liverpool.**

● Unfortunately we don't know of any company planning on producing these products although you can get the original object-oriented language – Smalltalk – from Smalltalk Express Ltd., Denmark House, The Broadway, London NW9 7BW. At the time of our review, October 1990, it cost £540, and Little Smalltalk cost £30.

WANT to write to The Micro User? The address is:

Letters, The Micro User, Europa House, Adlington Park, Macclesfield SK104NP.

Writers of the most interesting letters receive a £10 prize.

Joy to the games

I AM the proud owner of a new A5000 which I use mainly for DTP and wordprocessing. I think that this is an excellent machine and can't find any problems with it.

However, to relax I like to play games on the machine and I am interested in buying a joystick. Is there one favoured more than others by the software writers?

I would like to play Scrabble on the Archimedes but will I have to settle for the PC version under the emulator? – **Mike Chappell, Clacton on Sea, Essex.**

● You will be need to attach a joystick interface to your machine and several are available and we will be examining some options in the near future. Most games support all the available types of interface.

Acorn have now proposed a standard joystick interface so that if a new type of joystick is produced all software that recognises the standard will work correctly.

A word to the wise: Most joystick distributors and manufacturers are producing for the PC, ST and Amiga markets and have little or no understanding of the Archimedes. So always bear this in mind when buying from a non-Acorn distributor.

For the moment you'll have to play Scrabble via the emulator I'm afraid.

Impressing Degas

COULD you please tell me how to translate Archimedes sprite files to the Atari ST – if possible in Degas format? – **Jason Keeler, Sawston, Cambs.**

● John Kortink has written a shareware program called Creator – the complement to Translator – which you should be able to acquire from most PD libraries. You will have to register with John though as this program is shareware not Public Domain.

Though it won't change your sprites into Degas files it will convert them into TIF and GIF files which can be read by many ST programs.

ALL programs printed in this magazine are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur, corrections are published as a matter of urgency.

Should you encounter error messages when you type in the program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in these pages.

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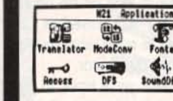

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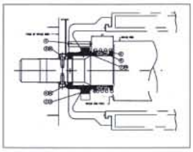

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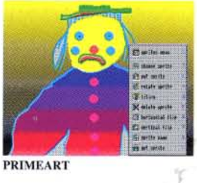

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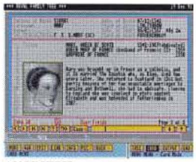

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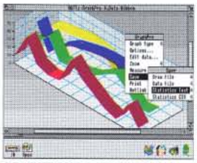

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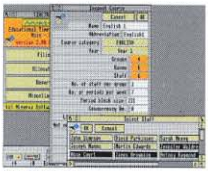

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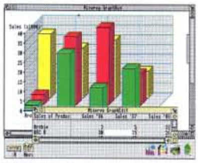

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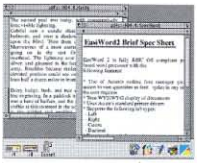

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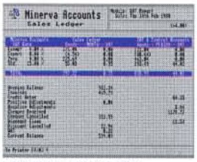

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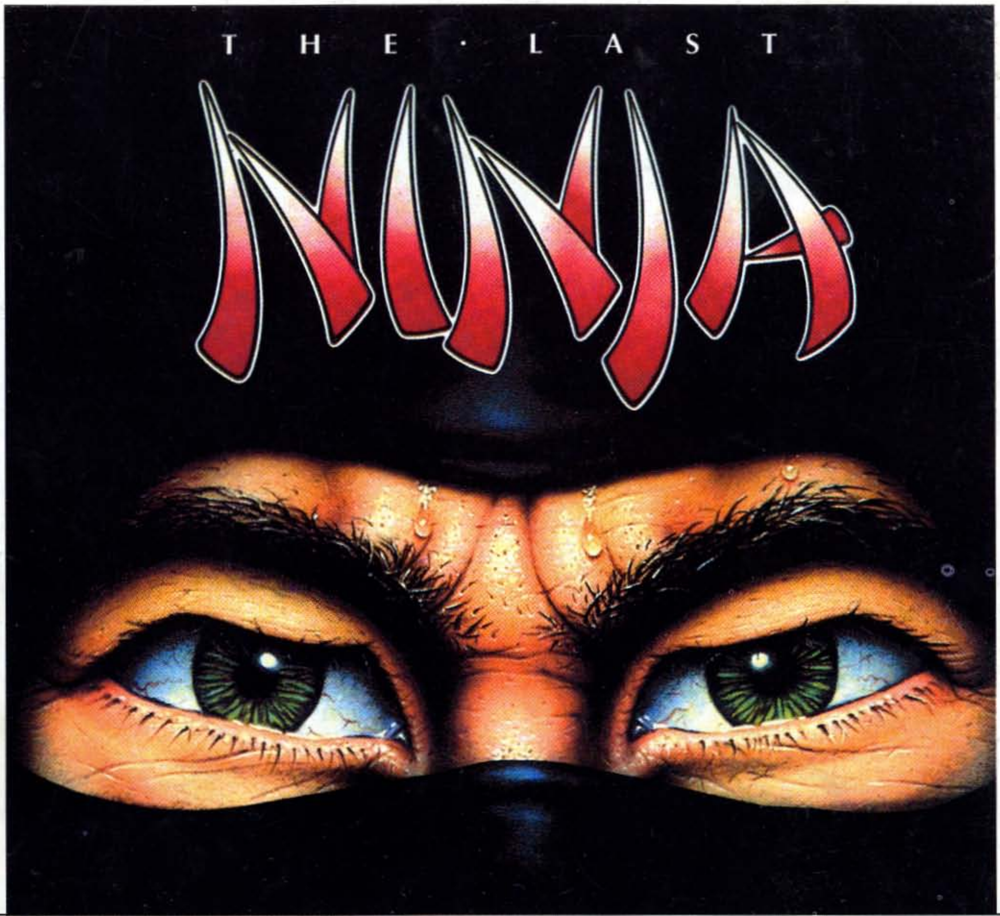

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